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ABSTRACT

This document is designed to help local Florida communities and applied technology educators restructure their applied technologies programs to support development of the essential skills described in Florida's school-to-work initiatives. Among the topics discussed are the following: principles of Florida's School Improvement and Accountability Initiative; visioning (the importance of a local vision, applied technology vision statement); goal 3 standards as common processes and abilities for applied technology's content areas; applied technology strands, standards, and benchmarks; learning and teaching (new approaches, teaching to student diversity); curricular connections through instruction (models for curricular connections in instruction, organizational models for instructional integration, interdisciplinary units); assessment; the learning environment; professional development; and applied technology program improvement. Appendixes constituting approximately 60% of this document contain the following: Florida's applied technology vision, mission, and aim statements; Florida's School Improvement and Accountability Act goal 3 connections between student and teacher roles and standard outcomes; applied technology's "all aspects of the industry" developmental framework; applied technology's sample performance descriptions; instructional strategies for a 21st century applied technology classroom; English-as-a-second-language teaching strategies for all students; strategies for at-risk students to improve learning; and Florida state standard connections between applied technology and academic skills. (MN)

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Preparing All Learners for Tomorrow's Work Force

Florida's Applied Technology Curriculum Planning Companion for the Sunshine State Standards

PreK-2
Grades 3-5
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Grades 9-12
Grades 13, 14 & Adult

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Florida Department of Education Sunshine State Standards

Preparing All Learners for Tomorrow's Work Force:

Florida's Applied Technology Curriculum Planning Companion for the Sunshine State Standards

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Introduction

Chapter Highlights

- **The Need for Reform**
- **Principles of Florida's School Improvement and Accountability Initiative**
- **The Value of Preparing All Learners for Tomorrow's Work Force Document**
- **The Standards Movement**

The Need for Reform

All over this country, educators, citizens, and political and business leaders are working toward educational reform, so that everyone has the necessary skills to succeed in this technological age. Technological advances require educational reform. The need for schools to change is reinforced by the importance of meeting the diverse needs of students, worldwide economic changes, and an array of political and social issues that demand new ways of operating schools.

Students need to prepare themselves to make well-reasoned, forward thinking, and healthy lifelong decisions in an ever-changing world. They must learn how to:

- Locate, comprehend, interpret, evaluate, manage, and apply information from a variety of sources and media;
- Communicate effectively in a variety of settings and for a variety of purposes through many different media;
- Use mathematical skills to analyze information, solve problems, and create products to meet new needs;
- Think creatively and critically and become skilled in systematic problem solving;
- Purposefully allocate resources needed to solve problems;
- Understand systems processes and how to use technologies;

- Develop the integrity to work cooperatively and effectively with people from diverse backgrounds; and

- Be knowledgeable in all broad aspects of business/industry including: planning, management, finance, technical and production skills, technology, labor, community issues, health, safety, environment, and personal conduct.

These skills will be needed in traditional employment, as well as the rapidly growing non-traditional employment situations, such as contract, home-based, project, consulting employment, or new forms of entrepreneurship. Florida has created a system of School Improvement and Accountability to reform public school education. The goal of this initiative is to raise student achievement to world class levels. To this end, new high-level educational standards have been created delineating expected achievement by *all* students. (These standards are presented in this document in Chapter 3.)

Principles of Florida's School Improvement and Accountability Initiative

- **All students can learn at high levels with proper instruction in a supportive environment.**
- **All schools can be successful.**
- **The focus is on what students need to know and be able to do for the twenty-first century.**
- **The state wide focus is on accountability for student achievement and the school focus is on student performance.**
- **Students' health, safety, social, and educational needs must be met collaboratively by schools, business, agencies, the community, and parents.**
- **The education stakeholders, including students, parents, educators, administrators, support staff, employers, business and community members, are best able to determine the appropriate strategies to identify and solve school problems and to improve instruction.**
- **The individual schools are the units of educational accountability for improving student performance, and school-level public reporting of effectiveness is a critical component of accountability.**
- **Continuous quality improvement is required in the work place. It results in a customer focus, collegiality, teaming, collaboration, responsiveness, flexibility, innovations, risk taking, and effectiveness.**

Florida's initiative invites schools to develop learning activities for students that deal with substantial, meaningful knowledge as it is related to performance in real life. All teachers must relate curriculum contents to the learner's world for *each* student to learn and demonstrate learning. This current Florida educational initiative differs from earlier approaches to school reforms which were often characterized by detailed legislative mandates and minimum standards. In this initiative, the state's focus is on holding schools accountable for high levels of student achievement. It leaves local districts and schools free to identify problems and develop solutions in order to improve schools. It allows schools to design learning environments and experiences to meet the unique needs of the students in their communities. Education reform is about building capacity at the local level to identify and solve problems related to raising student achievement. Raising student achievement requires:

(1) raising expectations through high academic standards grounded in a foundation of reading, writing and mathematics,

(2) developing real world perspectives and work place abilities in both students and teachers, and

(3) improving the environment for and delivery of instruction based on what is now known about how people learn.

The Value of Preparing All Learners for Tomorrow's Work Force Document

This document is a resource and a guide for local educational communities as they restructure their schools and programs. It does not prescribe the specifics of classroom instruction. It presents broad, comprehensive concepts and ideas for development of curriculum and instruction. Curriculum guides will need to be developed locally to provide specific content, teaching, learning, and classroom assessment activities. They will need to be far more detailed than this framework, reflect the qualities and flavor of the community, and support the unique needs of the students in the community.

Instruction in all subject areas must support the development of the essential skills described in Florida's School-to-Work initiatives. Connections to the community and workplace should be fostered within real life and work-based projects. Awareness, orientation, exploration,

preliminary career focus, and career specialization may be provided through following the benchmark levels:

- ✔ Grades Pre-K-2 — awareness
- ✔ Grades 3-5 — orientation
- ✔ Grades 6-8 — exploration
- ✔ Grades 9-12 — preliminary career focus
- ✔ Grades 13 + — career specialization.

To help local applied technology educators meet these challenges, this document:

- ◆ Delineates which student learning the state will hold schools accountable for at five developmental levels (grades Pre-K-2, 3-5, 6-8, 9-12, 13-14 and adult);
- ◆ Gives sample performance descriptions of how students might demonstrate these skills and knowledge;
- ◆ Correlates sample performance descriptions to Florida's Education Goal 3 Standards;
- ◆ Encourages districts and schools to develop curricula that are guided by a locally-developed vision;
- ◆ Promotes the selection and use of well-developed, flexible, and innovative instructional strategies;
- ◆ Provides overviews of models of good teaching, learning, and assessment;
- ◆ Presents ideas for developing connections within applied technology topics with other disciplines;
- ◆ Discusses practical aspects of designing a quality learning environment;
- ◆ Provides suggestions for the professional development of teachers; and
- ◆ Includes suggestions and criteria for continual district and school subject-area program improvement.

The Standards Movement

The current effort to develop national standards in various subject areas can be traced back to September 1989 when the nation's governors recommended that America establish

national educational goals. Leading education reformers established goals through *America 2000* (later renamed *Goals 2000*) along with a plan to meet these goals. To implement the plan, the National Council on Education Standards and Testing was created which recommended the development of voluntary national standards. The National Council of Teachers of Mathematics led the way in the development of national academic standards; subsequently, standards have been developed in many other academic areas.

The National Commission for Industry Standards was awarded a grant to establish national standards for twenty-two broad industry classifications of careers in 1992. Subsequently, other businesses and professional organizations have developed their own national standards for their industries. Since that time the national industry standards have been continuously compared to existing secondary, post-secondary, and community college frameworks to assure all programs are meeting both general and specific national standards in their programs. This planning document pulls together the industry standards' reform to provide a foundation for the School-to-Work experiences provided in Florida's public schools from Pre-K through post secondary education.

The *Secretary's Commission on Achieving Necessary Skills (SCANS) Report*, developed by the U.S. Department of Labor, verified the need for a plan for educational reform. The Commission was charged with examining the demands of the workplace and determining whether the young people of the United States were prepared to meet those demands. Specifically, the Commission was directed to define the skills and competencies needed for employment, propose acceptable levels of proficiency, suggest effective ways to assess proficiency, and develop a strategy for assuring that the identified skills and competencies become a part of the learning opportunity for every American student.

The first SCANS Report, *What Work Requires of Schools*, published in June 1991, defined the workplace competencies and foundation skills required for effective job performance in today's marketplace as well as for the future.

The SCANS Competencies	Foundation Skills
RESOURCES Allocates Time Allocates Money Allocates Material and Facility Resources Allocates Human Resources **INFORMATION** Acquires and Evaluates Information Organizes and Maintains Information Interprets and Communicates Information Uses Computers to Process Information **INTERPERSONAL** Participates as a Member of a Team Teaches Others Serves Clients/Customers Exercises Leadership Negotiates to Arrive at a Decision Works with Cultural Diversity **SYSTEMS** Understands Systems Monitors and Corrects Performance Improves and Designs Systems **TECHNOLOGY** Selects Technology Applies Technology to Task Maintains and Troubleshoots Technology	**BASIC SKILLS** Reading Writing Arithmetic Mathematics Listening Speaking **THINKING SKILLS** Creative Thinking Decision Making Problem Solving Seeing Things in the Mind's Eye Knowing How to Learn Reasoning **PERSONAL QUALITIES** Responsibility Self-esteem Social Self-management Integrity/Honesty

This report continues to impact schools as they equip students with marketable skills. Florida's School Year 2000 initiative conducted research and verified the importance of these national skills for Florida's job market additionally. The SCANS competencies provide the basis for Florida's Education Goal 3 Standards which is fully described in Chapter 2.

Applied Technology curriculum includes specific programs designed to provide awareness, exploration, and training to enter, advance, or cross-train in industry. Specific instruction in

applied technology generally begins in middle school; however, there are many related skills that need to be included in the Pre-K through post secondary education experiences. The strands for Applied Technology are important aspects of all industries. They include (1) planning, (2) management, (3) finance, (4) technical and production skills, (5) technology, (6) labor, (7) community issues, (8) health, safety, and environment, and (9) personal conduct. These aspects of industry are referred to in the School-to-Work legislation and in the standards' initiatives at both national and international levels.

Key Introduction Points

- **Technological advances and a global economy are fueling educational reform.**
- **For the 21st century work place learners must be effective information managers, communicate in a variety of settings through various media, possess ability to apply mathematical skills in the work place, think creatively, allocate resources, understand systems and wisely use technology, possess integrity and work cooperatively with people from diverse backgrounds, and be knowledgeable in all aspects of business/industry.**
- **This document presents the general knowledge, skills, and abilities needed for Preparing All Learners for Tomorrow's Work Force. The individual school districts and schools can utilize this document to develop local curriculum guides that will provide specific content, teaching, learning, and assessment activities.**
- **The SCANS competencies, Florida's Goal 3 standards and the school-to-work initiatives were influential in the development of this document and are incorporated in it.**

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Applied Technology Selected Resources

For Introducing the Framework

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Chapter 1: Visioning

Applied Technology Vision:

All Floridians will possess the knowledge, skills, attitudes, and abilities necessary to achieve continuous self-sufficiency.

Chapter Highlights

- **The Importance of a Local Vision**
- **Creating a Vision: The Local Process**
- **Underlying Principles of a Vision for Applied Technology Learners**
- **Applied Technology Vision Statement**

More new information has been produced in the past 30 years than in the previous 5,000; a weekday edition of The New York Times contains more information than the average person of the 16th century would encounter in a lifetime; and the amount of available information now doubles every five years (Tarcher, 1991). All indications are that the amount of available information now doubles even faster than the five years cited by Tarcher in 1991. Acceleration of the information age demands a different kind of learner.

Parents, business, industry, government, the military, and community organizations are demanding better performance from all learners. Expectations of all groups have increased to keep pace with today's world competition. Today's students must learn how to think, make decisions, work on teams, and **continue to learn** as well as read, write, and follow directions. Youth and adults entering or reentering the workplace must be equipped with necessary skills for the workplace. Parents are demanding an education that will allow their children to become independent and successful in their future life and career roles.

The decision of a young person to move directly into post-secondary education or the work place is not viewed as mutually exclusive or the decisive factor in his or her life. It is the role of educators, employers, parents, and other support groups to help blend these experiences so that they reinforce each other, ensuring maximum individual and employee development. Individual learners will ultimately assume the responsibility for the quality of their lives through their own decisions and performance.

> The illiterate of the year 2000 will not be the individual who cannot read and write, but the one who cannot learn, unlearn, and relearn.
> --Alvin Toffler

Individuals and organizations who are most successful and satisfied are those that make learning a high priority and have a clear vision of what they want to accomplish. The saying, "if you don't know where you're going, you'll probably end up somewhere else" is more important in today's world than ever before. A clear vision, defined mission, and specific aims coupled with commitment of resources are critical for reversing the public opinion of education from dissatisfaction to satisfaction and support. The current mismatch in community expectations of schools and perceived performance of schools can be narrowed through collaborative development and vigorous implementation of a local vision.

The Importance of a Local Vision

Florida's education improvement initiative can be best realized if local community members come together to articulate a shared vision for educational excellence in their community. Once this picture is clearly in the minds of education stakeholders, (i.e., educators, support staff, students, parents, business, and community) they will often insist on changing old ways. However, unless everyone understands the reasons for reform, the desired outcomes will not be realized.

Creating a Vision: The Local Process

Applied technology educators in every Florida school district, community college, and university are encouraged to develop and embrace a vision that defines their discipline, provides purpose and direction for improvement efforts, unifies the delivery continuum Pre-K through post-secondary, and articulates the goals and values of applied technology education. Vision

builders should focus attention on how best to help students reach Florida's high academic standards for both postsecondary education and employment in the work place. They should also recommend best practices in curriculum, instruction, and assessment through purposeful inclusion in the school improvement process and plan.

Underlying Principles of a Vision for Applied Technology Learning

Certain underlying principles support the vision for applied technology education articulated in this document. These include:

- Every person is a learner. Educational professionals, students, parents, business, and community representatives form a community of learners.
- Effective teaching and learning connect concepts and processes to everyday events.
- A learning environment conducive to quality teaching and learning is the responsibility of the education and business community.
- Learning takes place in homes, schools, communities, and the workplace.
- Cultural diversity enriches the learning environment.
- Instructional programs and teaching strategies should accommodate diverse learning styles and needs.
- Excellence in applied technology teaching and learning grows from a commitment shared by teachers, students, parents, administrators, and the business community at large.
- Learning is a lifelong process. Successful learners are lifelong learners.

At a time when society is struggling to cope with technological advances, global economic competition, and social diversity, Florida's public is looking to schools to lead the way into the twenty first century. *Florida's System of School Improvement and Accountability*, addresses the challenges of our changing society and how Florida educators are responding to meet those challenges. Goal Two of *Florida's System of School Improvement and Accountability* states, "Students graduate and are prepared to enter the work force and post-secondary education." It is this affirmation of the applied technology premise, "to prepare all learners for tomorrow's workforce," that is bringing employers and the community together. Educators, job training providers, and other public service agency providers are building a coordinated system of education and services that begins in Pre-K and continues into adulthood providing a local school-to-work continuum.

Applied Technology Vision:

All Floridians will possess the knowledge, skills, attitudes, and abilities necessary to achieve continuous self-sufficiency.

Successful learners must have experiences needed in all aspects of an industry and understand the relationship of workplace success to life roles. Value must be placed on both hands-on (applied) and abstract learning. By tying contextual strategies to the real world and workplace expectations in all educational disciplines, students will appreciate the connections between learning and their roles in life.

In this vision, the student involvement in applied technology starts with the student entering, exiting, and reentering education at several points. When the system preparing all Floridians to achieve continuous self-sufficiency is complete that exit point may be a high school, an apprenticeship, a vocational technical center, community college, or a university program. It may be through one-stop career centers, literacy education, family training, or community-based programs for self sufficiency. The system will serve any area of the state (rural, suburban or urban), via distance, school-based, or work-based learning, which connects education to the community and workplace. It will be driven by customers including both students and employers.

Applied Technology Mission:

Florida will develop standards and benchmarks, allocate resources, provide technical assistance, and assess performance for education and training providers based on high levels of student achievement, a safe learning environment and the continuous self-sufficiency of all Floridans.

All students at each benchmark (grade grouping) level are provided access to educational and supportive services. The benchmark levels for Applied Technology include Primary (Pre-K through second grade), intermediate (third through fifth grade), middle (sixth through eighth

grade), high school (ninth through twelfth grade), and postsecondary (beyond high school including adult, technical, and college training).

Primary (pre-K through second grade), and intermediate (third through fifth grade) elementary students will be provided with developmentally appropriate career and technology education activities. Career and Technology Learning Activities (TLA) will be integrated into the curriculum utilizing work and life roles. Organization and production skills required for success in all workplaces and community activities will involve parents, business partners, and teams of educators working cooperatively to improve learning. Learners will be involved with local business and community leaders in workplace and community related activities.

Middle school students will explore technologies anchored in career applications and connect to mathematics, science, communication, and other academic disciplines. Additional school-based learning involving local business, industry, and community leaders, such as integrated career projects shadowing, service learning and other work-based activities, will be provided to all seventh and eighth grade students. These students will also undergo an extensive career assessment and develop a concrete but a flexible program of study prior to high school registration. Planned programs of study should relate students' career aspirations to articulated workplace entry and post secondary education.

All high school students will have continued career and educational assessment connected to structured programs of study. These programs will be designed with appropriate higher-level academic content tied to related work and community service activities. Students will continue to refine a career path with program characteristics, entrance and exit requirements, and performance demonstration outcomes as they progress through high school. The programs will provide opportunities for students to articulate into a seamless apprenticeship, technical, or postsecondary program. All students will have job training related to their career aspirations delivered through a sequential curriculum incorporating work experiences. Such experiences will be developed by local school personnel or business partners and community-based organizations who work with the school improvement program teams. Students will often earn technical or college credit in their program while in high school and while preparing to enter a

career field. Students who have left the educational system for whatever reason—dropping out, incarceration, alternative placement—will be provided methods for reentry into the system to develop academic and workplace skills. Community service activities and employment opportunities will be built into their individual programs.

The vision for Florida's Applied Technology system requires that students be provided with experiences in the knowledge, skills, and attitudes needed to successfully participate in all aspects of an industry and fulfill life roles, thereby achieving current and future self-sufficiency. Included in the applied technology framework are life and industry skills in planning, management, finance, technical, applications, and production. Students also address technology, labor, community, health, safety, and environmental concerns, as well as, and personnel conduct on the job.

- **Pre-K through second** grade students will participate in concrete activities which are school-based, work-based, or community based. The classroom is identified as the ***first real workplace*** we experience. Learning how to work with others, how to learn, how to communicate, how to demonstrate appropriate social behaviors constitute much of our young students' first jobs.

- **Intermediate (third through fifth grade)** students will experience a combination of school-based, work-based, and community activities connecting school and work. Learning to organize oneself and others, participating in small group dynamics, and communicating in written words, numbers, and charts are examples of important skills. The school will continue to become the focus of work and connections to real life. Some schools will opt for a comprehensive "micro-society" approach while others expand existing initiatives within the school including: Technology Education Laboratories, multi media announcements, school stores, spirit shops, postal centers, E-mail systems, art's festivals, celebrations, safety campaigns, and other life and career related activities.

- **Middle school** will provide students with opportunities to explore broad industries. They will make initial decisions about career interests and become oriented to initial workplace skills. Technology laboratories involving teams of teachers and learners will address relative problems in modular laboratories. Such laboratories may incorporate many different applied technology areas across industries with teams of learners simultaneously analyzing different issues or creating new models.

- **High school** programs will provide for in-depth study, practice and specialization in a career cluster or program of study related to a major industry with demonstrated high

wage/high skill job growth. All students will pursue connecting activities and work-based related to the job or industry they are planning to enter.

- **Postsecondary** programs will provide specialized and advanced training for employment and advancement in an industry. The focus of most training programs will be in career areas which provide high wage/ high skills and are in demand within Florida.

Learning in schools, communities, and work places will be organized to prepare all youth for success in postsecondary education and immediate employment. At-risk students including various categories of exceptional students, and targeted populations will participate in job training coupled to an individually planned and challenging curriculum. Work experiences will be developed by local teams representing community based, education, and business organizations. Multiple completion routes will be articulated across educational community-based, youth, social service, other public sector, and business and industry organizations. Local school improvement plans will reflect specific commitments to quality preparation of students for workplace and ongoing educational success.

LONG-RANGE AIMS of Applied Technology

→ **School-to-Work**--Florida's initiative will provide all students pre-K through adult a coordinated system of programs facilitating the school to career continuum.

→ **High-Wage/High-Skill-Education** and training programs will be aligned with the Occupational Forecasting Conference to provide business and industry with a ready workforce and to assure the continuous, self-sufficiency of Florida's workforce.

→ **One-Stop Career Centers**--All Floridians will have access to an integrated database that will contain complete information about educational and occupational opportunities statewide and all related support services necessary to attain and maintain self-sufficiency.

→ **Welfare-to-Work**--Welfare recipients will have access to education and training systems leading to self-sufficiency within the requirements of welfare-to-work legislation.

→ **Literacy**--All Florida citizens will have access to literacy education and training services through school, work, social services and/or career centers which will enable them to become self-sufficient, critical readers and productive workers.

→ **Family issues** -All students will have the opportunity to acquire knowledge and skills to strengthen families and empower individuals to take action for the well-being of themselves and families in the home, workplace and communities.

In conclusion, a local vision of teaching and learning in applied technology reflects the highest ideals of a school community, unifies it, and clarifies its commitment. Developing a local vision for improving applied technology education is a continuous process, a quality process that improves applied technology teaching and learning.

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Key Chapter Points

- Visions unify a group by sensitizing everyone to the nature of commitment.
- Teaching and learning will continue to change and improve as our society changes and additional knowledge is gained.
- Because they are products of communication, visions are neither static nor restrictive.
- The vision statement serves to inspire participants into believing that learning in applied technology can be different and better.
- Local educators and business/community partners are challenged to become actively involved in assuring the quality of applied technology education for all students.
- A vision statement helps generate a sense of deliberate and conscious effort in all that is done, serving to focus a community's imagination and energy.
- **Applied Technology Vision:**
  All Floridians will possess the knowledge, skills, attitudes, and abilities necessary to achieve continuous self-sufficiency.
- **Applied Technology Mission:**
  Florida will develop standards and benchmarks, allocate resources, provide technical assistance, and assess performance for education and training providers based on high levels of student achievement, a safe learning environment and the continuous self-sufficiency of all Floridans.
- **Applied Technology Aims**
  → **School-to-Work**--Florida's initiative will provide all students pre-K through adult a coordinated system of programs facilitating the school to career continuum.
  → **High-Wage/High-Skill-Education** and training programs will be aligned with the Occupational Forecasting Conference to provide business and industry with a ready workforce and to assure the continuous, self-sufficiency of Florida's workforce.
  → **One-Stop Career Centers**--All Floridians will have access to an integrated database that will contain complete information about educational and occupational opportunities statewide and all subsequent support services necessary for any Floridian to attain and maintain self-sufficiency.
  → **Welfare-to-Work**--Welfare recipients will have access to education and training systems leading to self sufficiency within the requirements of welfare-to-work legislation.
  → **Literacy**--All Florida citizens will have access to literacy education and training services through school, work, social services and/or career centers which will enable them to become self sufficient, critical readers and productive workers.
  → **Family issues** -All students will have the opportunity to acquire knowledge and skills to strengthen families and empower individuals to take action for the well-being of themselves and families in the home, workplace and communities.

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Visioning

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Chapter 2: Goal 3 Standards as Common Processes and Abilities for the Content Areas

Chapter Highlights

- **Goal 3 Standards**
- **Integrating Goal 3 Standards into Day-to-Day Instruction**
- **Using the Goal 3 Standards**
- **Incorporating Goal 3 Standards into Instruction and Assessment**

Although one of the purposes of this document is to identify what a student should know and be able to do in applied technology, -that is, the specific subject area standards and benchmarks articulated in Chapter 3 of this document—it is important to realize that the applied technology standards and benchmarks do not exist in isolation. There are some very general processes and abilities that cut across all subject areas: the mental processes involved in locating information, organizing that information, and then using it to solve some problem or produce a product. Similarly, the mental processes involved in identifying the resources necessary for accomplishing a goal, setting milestones, and then managing those resources are common across subject areas. They are also important to success in home, community, and work world roles.

These practical important transdisciplinary processes and abilities have been identified in the document *A System of School Improvement and Accountability.* In Goal 3 Student Performance of the eight goals that are the foundations for school reform in Florida, it states:

> ***Students successfully compete at the highest levels nationally and internationally and are prepared to make well-reasoned, thoughtful, and healthy lifelong decisions.***

Eleven standards are identified within Goal 3. Of these, ten deal specifically with student outcomes. It is important to realize that the term ***standard*** is used somewhat differently in *this* chapter than it is in Chapter 3. In Goal 3, a standard is a general category of processes and abilities that can be used and are important to all subject areas and the world of work. The standards described in Chapter 3 of this document refer to the knowledge and skills specific to applied technology.

The Goal 3 Standards have been adopted by the State Board of Education and represent part of what the state will hold schools accountable for teaching.

GOAL 3 STANDARDS

Standard 1	***Information Managers***
Standard 2	***Effective Communicators***
Standard 3	***Numeric Problem Solvers***
Standard 4	***Creative and Critical Thinkers***
Standard 5	***Responsible and Ethical Workers***
Standard 6	***Resource Managers***
Standard 7	***Systems Managers***
Standard 8	***Cooperative Workers***
Standard 9	***Effective Leaders***
Standard 10	***Multiculturally Sensitive Citizens***
Standard 11	***Parental Involvement***

In each subject area in the state of Florida, students will be expected to hone their skills and abilities as information managers, effective communicators, and so on. Indeed, Florida's public schools are accountable to parents, taxpayers and business people for students ability to apply the first ten standards of Goal 3. Schools are expected to conduct assessments which will, along with external assessments conducted by the state on the first four standards, show that

students are making progress toward Goal 3. This chapter describes some ways in which these eleven general standards can be addressed in applied technology.

Integrating Goal 3 Standards into Day-To-Day Instruction

The Goal 3 standards do not exist in isolation. Given their nature, they should be an integral part of daily classroom instruction and assessment. To a great extent, the Goal 3 standards can be thought of as generic processes and abilities those help students apply specific applied technology content knowledge in real-world situations. As students learn applied technology content, they apply their knowledge using the processes and abilities involved in being an information manager, effective communicator, numeric problem solver, and so on.

Teachers should directly address these processes and abilities and even call them by name. The specifics of what should be taught regarding each of these processes is presented in the next section. It is important that the Goal 3 processes and abilities should become a common "language" used across every classroom.

Using the Goal 3 Standards

The eleven Goal 3 standards must be included in every subject area at every grade level. In Appendix 2A is a detailed list of the skills and abilities associated with each standard at each of the five grade levels: Pre-K-2, 3-5, 6-8, 9-12, and Post-secondary.

Standard 1: *Florida students locate, comprehend, interpret, evaluate, maintain, and apply information, concepts, and ideas found in literature, the arts, symbols, recordings, video and other graphic displays, and computer files in order to perform tasks and/or for enjoyment.*

Success on Standard 1 is necessary for success in school, life, and the workplace. Infusion of technology, multimedia, and the Internet has placed increased demands on information management skills. In an information age, people frequently face challenges in locating, interpreting, applying, evaluating, and storing information. Daily tasks requiring competence on Standard 1 include:

- Interpreting news, weather, or financial reports on TV or in the newspaper;
- Reading or giving directions to complete a technical task;

- Understanding and following directions to operate an electronic appliance;
- Accessing information from data storage systems, such as electronic encyclopedias, atlases, or a library;
- Setting up and operating a new appliance such as a VCR;
- Analyzing and troubleshooting technical problems with technology;
- Following instructions to complete Income Tax returns;
- Organizing important documents and records;
- Interacting on electronic networks, such as the Internet;
- Installing software on a computer; and
- Applying business related computer applications.

Standard 2: *Florida students communicate in English and other languages using information, concepts, prose, symbols, reports, audio and video recordings, speeches, graphic displays, and computer-based programs.*

Effective communication deals with the learner's capacity to convey thoughts, ideas, and information purposefully. Communications are transmitted when a student speaks, writes, charts, graphs, or performs. Media technologies significantly enhance communications. The purpose of Standard 2 is to ensure that Florida students are skilled in communicating in English and other languages. Proficiency in *other languages* means that students are expected to function using not only English, but using other foreign languages. Languages pertinent to specialized areas include for example, mathematical notation and vocabulary, scientific language, Latin terminology, music notation, American sign language, industry specific technical terms, and computer terminologies.

Communication is an essential form of human engagement. Success on Standard 2 is necessary for success in school, at home, and in the workplace. Common activities that involve communication skills are:

- Initiating, listening, and maintaining conversation;

- Creating a multimedia presentation to sell a new marketing strategy;
- Writing a letter of application (for jobs or educational programs);
- Producing formal or informal announcements;
- Writing, reading, and utilizing technical reports;
- Writing, delivering, or analyzing a speech;
- Viewing, listening, and evaluating a technology learning activity; and
- Describing and debating problems, solutions, or action as a team or committee member.

Standard 3: *Florida students use numeric operations and concepts to describe, analyze, communicate, synthesize numeric data, and to identify and solve problems.*

Numeric problem-solvers analyze and solve mathematical, logical, or quantitative problems in the context of school, home, and work. The intent of Standard 3 is to help learners use mathematical concepts and related results to make real life or workplace decisions. Numeric problem solvers gather, read, manipulate, interpret, organize and analyze quantitative data. They use mathematical symbols and language to verify, display, explain, and justify solutions to quantitative or mathematical problems. Students must take advantage of technologies such as calculators and computers to support their work.

Common examples of activities that require mathematical problem solving proficiency include:

- Analyzing, estimating, displaying and presenting costs for a project or activity;
- Analyzing, determining, displaying and explaining profit or loss in various situations;
- Organizing, developing and maintaining a personal business plan, forecast and status;
- Analyzing, calculating, and communicating area or parameter costs; and
- Explaining, developing, and communicating statistical displays using measurements, charts, graphs, formula and verbal explanation.

Standard 4: *Florida students use creative thinking skills to generate new ideas, make the best decision, recognize and solve problems through reasoning, interpret symbolic data, and develop efficient techniques for lifelong learning.*

Developing critical and creative thinking skills in students involves gathering new information to answer questions and make conclusions, connections, and inferences from existing information. Creative thinking involves originality, the ability to find novel or unique relationships, and unusual solutions. Creative thinkers have a high tolerance for ambiguity and seek out opposing viewpoints.

The intent of Standard 4 is to help students become proficient in using critical and creative thinking processes to solve problems. They are eventually expected to apply various problem-solving processes such as the scientific method, statistical analysis, trial and error, and simulation techniques. Attitudes of persistence should be nurtured. Common examples of activities that require proficiency in critical thinking include:

- Developing, maintaining, and analyzing accounts and budgets for different purposes and
- Gathering, summarizing, analyzing and displaying data so that an informed, reasonable decision can be made.

Standard 5: *Florida students display responsibility, self-esteem, sociability, self-management, integrity, and honesty.*

Developing ethical and responsible workers focuses on developing positive social skills, self-management behaviors, self-esteem, and honesty.

Unlike Standards 1 to 4, which focus on cognitive and academic development, Standard 5 deals with affective and social growth. Instruction in Standard 5 occurs in formal and informal interactive settings. Teachers, parents, the school, the business community and the community as a whole work as partners to develop students as responsible workers. The environment must be conducive to nurturing the personal and social attributes that define Standard 5. Positive behaviors can be reinforced through consistent role models between peers and adults during school years. Mentoring, counseling and behavioral contracts are effective ways in which to

develop Standard 5 in students. Consistent, constructive, and timely feedback can play an important role in shaping desired behaviors. Some examples of how responsibility and honesty can be imparted are:

- At the primary level children learn to share and learn with each other, which initiates the concepts of fairness and community;
- At the intermediate level, children learn the concept of doing their own work as well as accepting the responsibility of their performance in cooperative projects;
- At middle school level, students are exposed to concepts of ownership and copyrights through differentiating among the applications for freeware, shareware and licensed software;
- In high school, students can learn responsibility and the value of team work through cooperative or service learning projects that require each individual to plan contribute and reflect on a project; and
- At the community college level, students can examine legal and ethical procedures and practices for a specific industry.

Standard 6: *Florida students will appropriately allocate time, money, materials, and other resources.*

Developing effective resource managers involves skills in the allocation and management of resources to complete projects and tasks. Instruction and assessment of Standard 6 occur as students prepare action plans to accomplish tasks, allocate resources, implement the plan, and evaluate whether or not adequate resources were allocated. Students can demonstrate their effectiveness as resource managers in school, at home, in the community, and the workplace.

The intent of Standard 6 is to help students become proficient in managing time, preparing and following time lines, preparing budgets, acquiring and distributing materials, allocating people, and other resources needed. Other resources could include facilities, technologies, or environmental considerations. The nature of the activities depends on purposes of the task and the developmental level of the child. Activities could be related to student government, clubs, school newspapers, school yearbooks, community service projects, part-time employment, or school projects. Common examples are:

- Managing a household or personal budget,
- Time management in school or work,
- Designing, managing, and evaluating a major project, and
- Managing tools, technologies, and materials in an applied technology task.

Standard 7: *Florida students integrate their knowledge and understanding of how social, organizational, informational, and technological systems work with their abilities to analyze trends, design and improve systems, and use and maintain appropriate technology.*

Developing proficient systems managers deals with helping students understand what systems are, how they work, and how to use the systems approach to solve problems or design solutions. Instruction and assessment of Standard 7 occur as students solve problems that help them see the big picture, its parts, and the relationship between the parts.

The intent of Standard 7 is to help students use the systems approach as a way of looking at the relationship between events and phenomena in their world. Efficient systems managers use systems concepts to solve problems, develop new models, or change existing systems to produce better results.

Various subject area concepts are integrated using the systems approach. Students should be able to identify and understand natural, social, organizational, informational, and technological subsystems and interdependence between them. Examples of grade level specific systems that students learn are:

- At the primary level, children learn that lunch at school occurs at a specific time, which may vary by age group, that they obtain food by passing through the food counter in a single file, and that there is a certain area of the lunch room where they are to sit;
- At the intermediate level, the concept of systems in the human body is developed;
- At the middle school level, students learn about various governments and specifically, the governmental system of the United States;
- At the high school level, students learn computer systems including hardware components such as a CPU (Central Processing Unit), I/O's (Input, feedback, and Output devices), and software such as operating systems, word processing programs, spreadsheet programs, etc.; and

- At the community college level, students learn the system of manufacturing in a specific industry including processes, inventory control, flow of a product, etc.

Standard 8: *Florida students work cooperatively to successfully complete a project or activity.*

Developing cooperative workers deals with the attributes and interpersonal skills necessary to work effectively in teams, a process being used extensively in the work world. Unlike Standard 5 (Responsible Workers), which deals with affective and social growth on a personal level, Standard 8 deals with goal- or task-oriented social behaviors that involve group work. To develop cooperative workers, opportunities must be provided for students to perform tasks and projects in cooperative groups. Such opportunities help students understand group processes, assume various roles in the group, keep the group on a task, motivate the group toward task completion, and evaluate the effectiveness of the group in accomplishing goals.

Standard 9: *Florida students establish credibility with their colleagues through competence and integrity and help their peers achieve their goals by communicating their feelings and ideas to justify or successfully negotiate a position which advances goal attainment.*

Developing effective leaders deals with the attributes and interpersonal skills necessary for students to advance group and individual goals, using appropriate skills in listening, communicating, decision-making, conflict resolution, and negotiation.

Standard 9 (Effective Leaders) is closely related to Standard 5 (Responsible Workers), which deals with affective and social growth on a personal level, and Standard 8 (Cooperative Workers), which deals with goal- or task-oriented group behaviors. In order to help develop effective leaders, opportunities must be provided for students to assume leadership responsibilities in safe, non-threatening environments. Such opportunities should help students in valuing direct communication, unbiased treatment of individuals, and in separating work and group-related issues from personal ones.

Standard 10: *Florida students appreciate their own culture and the cultures of others, understand the concerns and perspectives of members of other ethnic and gender groups, reject the stereotyping of themselves and others, and seek out and utilize the views of persons from diverse ethnic, social, and educational backgrounds while completing individually and group projects.*

Developing multiculturally sensitive citizens and workers deals with helping students become knowledgeable about their own cultural backgrounds and those of others. The intent of Standard 10 is to help students value and affirm the need for human dignity and respect. It involves broadening students' knowledge and understanding of the language, customs, beliefs, traditions, and values of different cultures.

Standard 11: *Families will share the responsibility of accomplishing the standards set in Goal 3 throughout a student's education from preschool through adult.*

Educators are encouraged to invite and facilitate the involvement of families in their children's education. Examples of standard 11 are **for parents, care givers and other supporters** to:

- Assist at home with homework and projects,
- Monitor progress through teacher conferences,
- Volunteer in the classroom,
- Generate community support, and
- Model lifelong learning.

Incorporating Goal 3 Standards into Instruction and Assessment

Schools will be held accountable for incorporating the Goal 3 student-achievement standards into instruction and classroom assessment. The following are examples of applied technology classroom activities that integrate the Goal 3 standards:

> *High school students are asked to bring in a job description or job advertisement that interests them; each student must write a cover letter and a resume for that job using the correct format and business-writing skills learned in class. Afterwards, students pair up to role-play an interview situation in which one student acts as a job applicant and the other as an interviewer. After each pair performs its role-play for the class, a discussion is held in which students offer constructive feedback. The role play may become a connecting activity by using business and industry personnel to conduct the interviews. Through this activity, students apply their oral and written communication and analytical skills to a real-life scenario.*

This example uses Standard #1, (Information Manager); Standard #2, (Effective Communicator); Standard #4, (Creative/Critical Thinker); and Standard #8, (Cooperative Worker.)

Students assess each other's technical manual while working in pairs. Each student critiques his or her partner's analysis and summary based on criteria created by the class with the teacher. Before the exercise, the instructor leads the students in an activity that demonstrates and models how to give constructive criticism. As the students critique each others' work, they use student developed guidelines for giving and receiving constructive criticism.

This example uses Standard 1 (Information Manager), Standard 2 (Effective Communicator), Standard 4 (Creative/Critical Thinker), Standard 5 (Responsible/Ethical Worker), Standard 8 (Cooperative Workers), and Standard 9 (Effective Leaders).

Key Chapter Points

- **As identified in Goal 3 of Florida Department of Education's, A System of School Improvement and Accountability, there are eleven general standards or processes that are necessary and should be imbedded in life and work roles.**

- **The eleven Goal 3 standards are:**

Standard 1	**Information Managers - capable of obtaining information from a wide variety of sources and utilizing the information in a productive and/or enjoyable manner.**
Standard 2	**Effective Communicators - in English and other languages**
Standard 3	**Numeric Problem Solvers - capable of applying skills and knowledge to solve real life and work problems**
Standard 4	**Creative and Critical Thinkers - capable of analyzing, interpreting, summarizing, and making appropriate connections to complete a task or solve problems.**
Standard 5.	**Responsible and Ethical Workers - who have positive self-esteem, honesty, and good sociability skills.**
Standard 6	**Resource Managers - capable of efficiently allocating time, money, materials, staff, and other resources.**
Standard 7	**Systems Managers - who understand and utilize natural, social, organizational, information, and technological systems.**
Standard 8	**Cooperative Workers - who work with other people with various backgrounds in an effective, productive manner.**
Standard 9	**Effective Leaders - who can communicate effectively, make decisions, resolve conflicts, and lead a diverse group effectively and productively.**
Standard 10	**Multiculturally Sensitive Citizens - who are knowledgeable and respectful of their own cultural background and those of others.**
Standard 11	**Parental Involvement - by being good role models and by physically, mentally, and emotionally supporting their children and the educational process.**

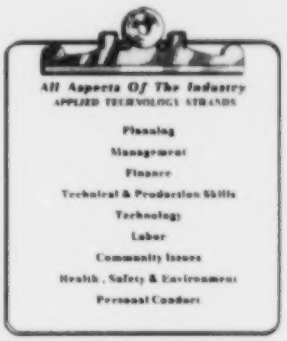
- **Schools will be held accountable for incorporating the Goal 3 student-achievement standards into instruction and classroom assessment.**

Applied Technology Selected Resources
Goal 3 Standards

Florida Department of Education. (1995, September). Florida's system of school improvement and accountability: Blueprint 2000. Tallahassee, FL: Florida Department of Education.

Bechtol, W. M., & Sorenson, J. S. (1993). Restructuring schooling for individual students. Needham Heights, MA: A Longwood Professional Book.

Chapter 3: Applied Technology Strands, Standards, and Benchmarks



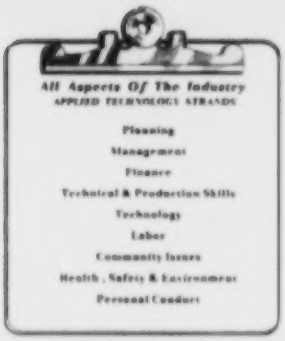
Chapter Highlights

- Need for Standards and Benchmarks
- Structure of Strands, Standards, and Benchmarks

The standards and benchmarks for applied technology represent the heart of this curriculum planning document. Requiring high standards in all areas of education supports' efforts to improve and enhance education in Florida. Before addressing the applied technology standards, it is useful to consider why we need them. In her book, *National Standards in American Education: A Citizen's Guide*, Diane Ravitch, former Assistant Secretary of Education at the U.S. Department of Education, explains that standards are a necessary and accepted part of American life in almost every field but education:

> Americans clamor for standards in nearly every part of their lives. They expect strict standards to govern construction of buildings, bridges, highways, and tunnels; shoddy work would put lives at risk. They expect explicit standards in the field of telecommunications; imagine how difficult life would be if every city, state, and nation had incompatible telephone systems. They expect stringent standards to protect their drinking water, the food they eat, and the air they breathe . . . . Even the most ordinary transactions of daily life reflect the omnipresence of standards. (pp. 8-9)

Standards have the potential of affecting many aspects of schooling in Florida. The applied technology curriculum—what teachers teach and how they teach it—should be organized around the applied technology standards. Assessment is an obvious area that will be affected. Assessment should be based on the standards established in this chapter. At the upper high school and community college level the industry specific skill standards will target these and additional skills required by the industry. The systems used to report student progress—report



cards and transcripts—should have a clear relationship to the standards. The standards presented in this chapter will improve students' preparation for the workplace and additional learning.

Structure of Strands, Standards, and Benchmarks

This chapter presents standards' in several levels of hierarchical information, each more specific than the previous.

Subject area = domain or content area such as applied technology, mathematics, science, language arts, and social studies

Strand = label (word or short phrase) for a category of knowledge, as it applies to each specific subject area such as planning, management, and finance

Standard = general statement of expected learner achievement within each Strand

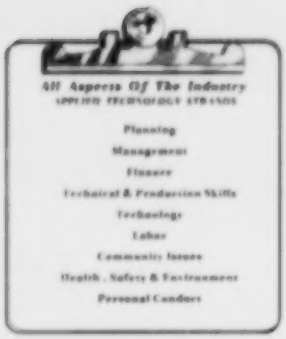
Benchmark = learner expectations for each standard (what a student should know and be able to do) at the end of the developmental levels of grades Pre-K-2, 3-5, 6-8, 9-12, 13-14 and adult.

Sample Performance Descriptions = examples of things a student could do to demonstrate achievement of the benchmark, and

Correlations to Goal 3 Standards = shows how the sample skills performance descriptions incorporate Goal 3.

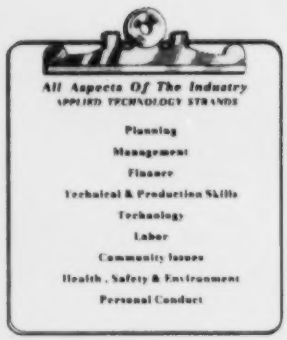
A strand is the most general type of information and is used to break down each subject area into categories of knowledge. For example, there are nine strands in Applied Technology. They are:

1. Strand 1.0 Planning
2. Strand 2.0 Management
3. Strand 3.0 Finance
4. Strand 4.0 Technical and Production Skills
5. Strand 5.0 Technology
6. Strand 6.0 Labor
7. Strand 7.0 Community Issues
8. Strand 8.0 Health, Safety, and Environment
9. Strand 9.0 Personal Conduct



Each of these strands contains one or more standards. A **standard** is a description of general expectations regarding knowledge and skill development within a strand. The Applied Technology Standards provide more specific guidance as to what students should know and be able to do in relation to each specific strand:

Strand	Standard(s)	
1. Planning	1.1	Applies planning methods to decision-making related to life and work roles.
2. Management	2.1	Employs management techniques to manage projects and enterprises related to work and life roles.
	2.2	Applies marketing and promotional techniques to products and services in a business or social setting.
	2.3	Demonstrates knowledge and abilities necessary as a contract employee or to initiate and maintain a service or product-based business.
3. Finance	3.1	Demonstrates financial planning ability and decision-making related to work and life roles.
4. Technical and Production Skills	4.1	Organizes work assignments by demonstrating production techniques.
5. Technology	5.1	Integrates academic and applied technology principles into the workplace.
	5.2	Applies appropriate technology to an industry to solve technical and production problems.
6. Labor	6.1	Demonstrates an understanding of labor issues related to the work place.
7. Community Issues	7.1	Analyzes and communicates the impact that industry and the community have on each other and on the individual.
8. Health, Safety, and Environment	8.1	Analyzes and communicates health and safety issues in the workplace and community.
9. Personal Conduct	9.1	Demonstrates an understanding of professional conduct in personal roles, as well as, in work and industry.



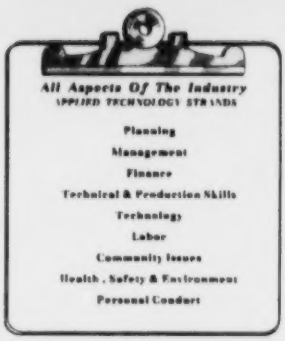
The most specific level of information is the **benchmark**. A benchmark is a statement of expectations about student knowledge and skill for each standard at the end of one in five developmental levels: grades Pre-K-2, 3-5, 6-8, 9-12, 13-14 and adult. [The complete table including benchmarks is in Appendix 3A].

Accompanying the benchmarks are **sample performance descriptions**. These sample performance descriptions suggest how teachers might ask students to apply the knowledge and skill described in the benchmark. For example, using Applied Technology Standard 1.1: ***Applies planning methods to decision-making related to life and work roles*** and using a benchmark for this standard at the grade 3-5 level - Benchmark 1.1.2.2 ***Demonstrates ability to plan ahead for different types of events.***

The sample performance description that accompanies this benchmark is: ***Have students develop a plan for some class function such as a class picnic, field trip, field day, etc.***

To perform this activity, students must apply the knowledge and skill described in the benchmark.

Finally, each benchmark is keyed back to specific Goal 3 standards. In Chapter 2, Goal 3 standards were described as an integral part of Florida education. The eleven standards within Goal 3 are to be integrated into each content area. This chapter identifies which Goal 3 standards are most compatible with each benchmark within each standard. The strands for applied technology were developed from the nine major aspects of industry recognized by the workplace and legislation. Up through the fifth grade level, the aspects of industry (standards) are developed through activities related to roles in life and the workplace. Beginning in middle school, explorations of specific aspects of industry are provided through classroom and school activities, business and industry contacts and visits, and development of individual career plans. By the 9th grade, students may begin to apply specific academic, vocational, and personal skills related to the career field of their choice. Through their curriculum at the 13-14 adult level, including community college or university programs increasingly specific industry driven standards would be expected.



Key Chapter Points

- Standards are the center of the effort to reform and enhance education in Florida. They are the starting points for this applied technology document.

- The hierarchic structure is:
  Subject Area = domain or content area, such as applied technology.
  Strand = most general type of information and is used to break down each subject area into categories of knowledge.
  Standard = general statement of expected learner achievement within each strand.
  Benchmark = learner expectation for each standard at each developmental grade level, [Pre-K-2, 3-5, 6-8, 9-12, 13,14-Adult]
  Sample Performance Activity = examples of things students could do to demonstrate achievement of the benchmark.
  Correlation to Goal 3 Standards = shows how the sample skills performance descriptions incorporate Goal 3 standards.

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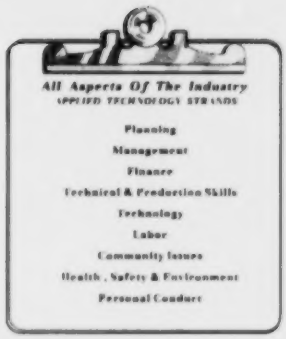
Applied Technology Selected Resources
Strands, Standards, and Benchmarks



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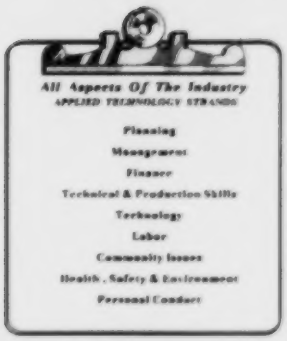

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Chapter 4: Learning and Teaching

Chapter Highlights

- **Unique perspective of Applied Technology Strands**
- **New approaches to teaching and learning**
- **Instructional strategies**
- **Snapshot of a 21st-century classroom**
- **Teaching to student diversity**
  - **Cultural diversity**
  - **Infusing a multicultural perspective**
  - **Developmental differences**
  - **Learning preferences**
  - **Students with disabilities**
  - **Students who are limited English proficient**
  - **Students at risk of dropping out**

The Unique Perspective of Applied Technology Strands

The applied technology curriculum encompasses and utilizes all facets of (1) planning, (2) management, (3) finance, (4) technical and production skills, (5) technology, (6) labor, (7) community issues, (8) health, safety, and environment, and (9) personal conduct. The curriculum includes competencies from all aspects of industry, and incorporates the knowledge and abilities required of ***ALL*** members of the work force, both for today and for the future. Learning begins at birth and continues as students are immersed in various aspects of applied technology at home, in the workplace, and in the community. Students arrive in our Pre-K classrooms with a varied knowledge base, and an effective Pre-K-14 applied technology program builds on this initial knowledge. The applied technology strands are applied to community and home life experiences at the Pre-K through 5th grade level. At the 6th to 8th grade level, the focus is on the individual's interests, aptitude, and abilities which are explored through broad career

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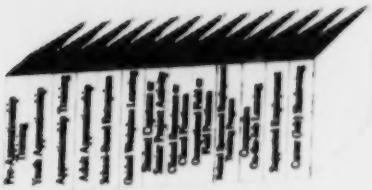


development activities. At the secondary level, selection of a "major" career area should occur. Also at this level activities that promote the application of each aspect of industry knowledge should be increased. These activities should also be more specific to each career area. Integrated experiences help students develop a variety of strategies, behaviors, and attitudes to fulfill their educational, and individual occupational goals. This chapter describes the kinds of learning and teaching that promote thoughtful, creative, and responsible citizens who are able to interact and contribute effectively in their local, state, and global communities.

New Approaches to Teaching and Learning

A tremendous amount of research is available to educators on how students learn and on how to design effective learning environments. This chapter highlights key elements that can help educators develop the best learning environments for all their students. It is important to remember that parents, business, industry, and community partners can make significant contributions in promoting a developmentally appropriate teaching and learning environment.

Developing a Learner-Centered, Authentic Environment

Curiosity, creativity, and higher-order thinking are stimulated when experiences are based on real, complex, and relevant ideas and materials. Identifying the interests of students provides another important perspective for engaging students in the learning process. Students learn best when called upon to make choices and assume more responsibility for their own learning. The teacher and other school and community participants including counselors, business persons, and parents provide support, guidance, and resources throughout the learning process.

Providing Collaborative and Cooperative Learning Opportunities

Some of the most efficient learning occurs when individuals are collaborating with each other in pairs or small groups. Providing students with the opportunity to interact with others in a variety of settings can enhance knowledge and understanding. Collaborative work allows students to obtain more feedback from fellow students than they can get from a single teacher. It can also encourage students to take intellectual risks. Students might pose their own work or life role related problems, devise their own approaches to problem-solving, clarify and defend their conclusions with the freedom to explore possibilities, and use the results to make informed

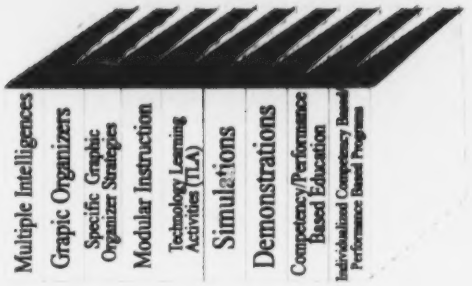
decisions. Students learn the valuable skill of working effectively with others to solve problems and perform investigations, and present possible solutions skills that are required in work and in personal lives.

Providing a Supportive Environment

The teacher is key to creating a supportive, effective learning environment. Teachers provide a supportive environment when they maintain fair, consistent, and caring policies that respect the individuality of students and focus on individual achievement and cooperative teamwork. Students' learning is enhanced when others see their potential, genuinely appreciate their unique talents, and accept them as individuals. Work is viewed as important and valuable to others. In such an environment, students learn quality work habits and skills while being responsible for themselves. Students also earn to make decisions, work cooperatively, negotiate conflicts, and take risks, while having the freedom to do quality work on their own initiative. In addition, a teacher who helps students learn self-control strategies can reduce the negative effect of factors that can interfere with learning, such as low self-esteem, lack of personal goals, expectations of failure or limited success, feelings of anxiety, insecurity, or pressure. In summary, a supportive learning environment and a variety of teaching strategies that promote exploration, discussion, and collaborative learning will go far to ensure that all individuals have the opportunity to see themselves as capable students, successful in learning applied technology.

Instructional Approaches in the 21st-Century Classroom

To support innovative applied technology learning, the instructional strategies that follow are provided as examples that educators can use or modify to provide useful and engaging educational experiences. Teachers may use or creatively adapt these instructional strategies to best fit the needs of the students and the instructional plan. They may be incorporated into a single lesson, project, or group activity, or used in collaboration with a colleague. Using and integrating instructional strategies effectively into the teaching process is an art. Instructional strategies are briefly introduced in this chapter. Descriptions are included in Appendix 4A with information on the "how to" and "benefits" of each strategy.



Instructional Strategies for a 21st-Century Applied Technology Classroom

Multiple Intelligences There are many forms of intelligence, many ways by which we know, understand, and learn about the world. Seven Intelligences have been identified: verbal/linguistic, logical/mathematical, visual/spatial, body/kinesthetic, musical/rhythmic, interpersonal, intra personal.

Graphic Organizers Visual representations of abstract concepts and processes. Students transfer abstract information into a more concrete form.

Specific Graphic Organizer Strategies A graphic organizer strategy in which students use diagrams or decision trees to illustrate real or possible outcomes of different actions. Flowchart, Venn Diagram, Webbing, Concept Mapping.

Modular Instruction A learner-centered and self-directed learning experience which may be designed for individuals or for small teams. Learning teams that are randomly scheduled so cooperation is required of students who may be from diverse backgrounds or groups. The abilities demonstrated are prerequisite to success on future jobs.

Technology Learning Activities (TLA) Teacher developed tool which fosters the development of problem solving skills while connecting curricula content with real life scenarios.

Simulations A learning process which involves students as participants in role-playing presentations and/or problem solving games imitating real-life situations or workplace environments.

Demonstrations Showing practical applications of theory, product, or equipment; may be performed by teacher, guest, or student.

Competency/Performance-Based Education Instructional programs that are based on industry validated skills, knowledge, and attitudes that have been identified as essential to training for a specific purpose or occupation. (The definition applies to any subject area).

Individualized Competency Based/Performance-Based Programs Competency-based instruction that is self-paced and designed to meet the needs of individuals with different learning modalities. The curriculum is developed through analysis of the occupation or purpose and based on industry validated skills, knowledge, attitudes, and performance.

Individualization Techniques Designing learning activities to fit the needs of the individual including one-on-one instruction, tutoring, modifying reading, performance, or writing assignments to increase or decrease the academic level, and providing technology required to adapt instruction for the individual.

Computer Assisted Instruction (CAI) Written and visual information presented in a logical sequence to a student through a computer. It is designed to be self-paced and monitor student performance. CAI may be interactive and multi-modal with the use of CD-ROMS and new technology.

Thematic Unit A topic of instruction in which several subject areas collaborate to reinforce the importance of the topic across and within the disciplines. The thematic unit is usually related to the real world or workplace. All disciplines may participate in thematic unit if encouraged to think and perform cooperatively and creatively.

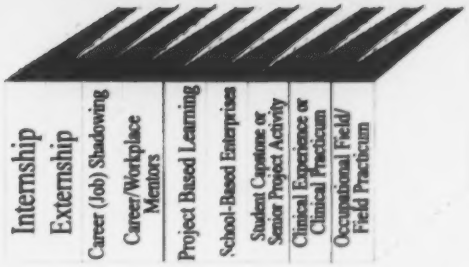
Pre-Apprenticeship Training Provides for remediating basic skills and employability skills in apprenticeship approved programs (usually subsidized learning targeted for at-risk students).

Youth Apprenticeship Provides specific technical training and competency attainment that lead to advanced standing and a progressive wage in an occupation approved by the Department of Labor (DOL). Youth Apprenticeship Training usually offered during the last two years of high school and provides monitored work (preferably paid) experiences which are integrated with classroom study and result in academic and occupational credentials.

Apprenticeship Training A combination of teachers and workplace mentors work collaboratively to assure work experience and guided learning within an industry or occupation cluster, linkage between secondary and postsecondary education credentials and certification of occupational skills, and both work site and classroom learning opportunities.

Adult Apprenticeship Provides training for journey level status in high wage occupations registered by DOL.

Guided Workplace-Learning Provides students with the opportunity to gain practical, first-hand knowledge in broad occupational clusters or industry sectors through a structured intern experience. This internship is designed to give students an opportunity to integrate occupational and applied academic learning, and to apply knowledge and skills learned in a classroom to actual work situations not generally available through paid employment.



Internship May be paid or unpaid workplace experience in roles that sometimes are more responsible than individuals would have as cooperative on-the-job-training (OJT) students. If an internship is unpaid, strict rules governing the training plan, activities, and length of time must be followed.

Externship A program designed to partner community leaders with students. The purpose of the externship is to provide realistic pictures of careers and roles of workers within an organization.

Career (Job) Shadowing An activity that enables young people to observe adults in work settings, learn the requirements of various jobs, and experience the flow of a typical workday.

Career/Workplace Mentors A one-on-one process using business, community, or industry representatives to interact with a student or a teacher as a guide or counselor in matters related to their education or future job choices.

Project-based Learning Any individually or team designed learning activity that has a culminating product, service, or demonstration related to real life or workplace application and is to be accomplished in a specified length of time.

School-Based Enterprises (School Sponsored Enterprises) An activity that engages students in providing services or producing goods for sale or use to people other than the participating students. Individual or sequenced courses are designed to provide skills needed for entrepreneurship through student run businesses.

Student Capstone or Senior Project Activity A major self-directed project of specific interest to the student which involves major improvement of their workplace skills, participation in the community through the workplace or service, and ends with a tangible product, report or demonstration to a group of designated officials or evaluators. (The evaluators may include members from the community, workplace, school, parents, school board, or other groups depending on the activity).

Clinical Experience or Clinical Practicum Provides training and experience in the actual work setting which usually requires licensure. Direct supervision by a faculty member of the program with expertise and experience in the occupation being pursued is required. The terms Clinical Experience or Clinical Practicum are usually used with health and medical related programs.

Occupational Field Experience/Field Practicum (Same definition as for clinical experience or clinical practicum.) The terms occupational field experience or field practicum may be used in any career cluster area of study requiring licensure.

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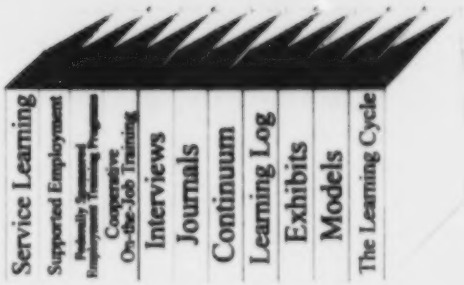


Service Learning A form of experiential education in which participants gain and apply knowledge and skills as they seek to meet real community needs. Service learning differs from conventional community service or volunteerism by incorporating structured reflection and links to the academic curriculum. It emphasizes concrete outcomes both for learners and for the community.

Supported Employment Used for placing individual with significant disabilities in paid employment positions. Job coaches assist in training throughout the transition and skill learning phase of employment by providing ongoing support.

Federally Sponsored Employment Training Programs Used for assisting targeted unemployed groups with comprehensive services to help get individuals trained or retrained and placed back into satisfying employment in the workplace.

Cooperative On-the-Job Training Combines classroom instruction with work experience and on-the-job training related to the student's career goals. The student receives pay for the work and course credit; a training plan signed by the parent, employer, school coordinator, and student is required. Regular visits and evaluation activities are required by the school coordinator and employee.

Interviews A strategy for person to person gathering information through questions and reporting the results of the session.

Journals A way for students and the teacher or other work team members to communicate regularly and carry on private conversations.

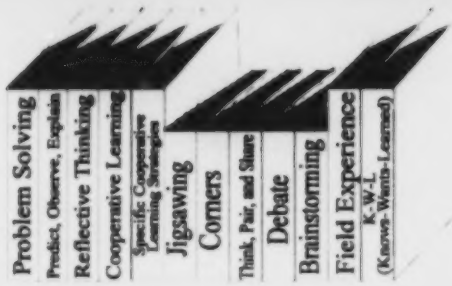
Continuum A strategy used to indicate relationships of words or phrases usually relating to performance.

Learning Log A strategy to develop structured writing. It is also a strategy that is useful in identifying workplace related learning experienced by a student at any level above second grade. An excellent follow-up to Knows-Wants-Learns (K-W-L).

Exhibits A strategy for creating a focused exhibit. These are particularly useful in relating career development experiences or skills.

Models A visual representation of a concept. It may be concrete, such as a balsa wood model of a bridge, cut away of an automobile transmission, or abstract like a model of weather systems.

The Learning Cycle A sequence of lessons designed to have students engage in exploratory investigations, construct meaning out of their findings, propose tentative explanations and solutions, and relate concepts to their own lives.



Problem Solving A learning strategy in which students apply knowledge to solve problems. This approach facilitates scientific thinking. It is used in every workplace and industry in some form.

Predict, Observe, Explain A strategy in which the teacher shows the class a situation and asks them to predict what will happen when a change is made.

Reflective Thinking Reflecting or thinking about what was learned after a lesson is finished, usually by writing what was learned.

Cooperative Learning A strategy in which students work together in small intellectually and culturally mixed groups to achieve a common goal. The outcome of their work reflects how well the group functioned.

Specific Cooperative Learning Strategies

Jigsawing A cooperative learning strategy in which everyone becomes an "expert" and shares his or her learning so that eventually all group members know the content.

Corners A cooperative learning strategy for learning a task and sharing that learning.

Think, Pair and Share A cooperative learning strategy for helping students develop their own ideas and build on ideas of co-learners.

Debate A cooperative learning strategy in which students organize planned presentations of various viewpoints.

Brainstorming A strategy for eliciting ideas from the group.

Field Experience A planned learning experience in the community for students to observe, study, and participate in a real-life setting, using the community as a laboratory.

K-W-L (Knows-Wants-Learned) An introductory strategy that provides structure for recalling what the student knows regarding a topic, noting what the student wants to know, and finally listing what has been learned and is yet to be learned.

Transdisciplinary Subject areas are presented in a totally integrated fashion. Subject areas address a common concept, theme, or problem. The classes meet in a common place and time with a team of teachers certified in various subject areas. The teachers team-teach. A major project often serves as the focus of the unit. Teacher planning, instruction, and assessment is integrated across disciplines.

A Snapshot of Effective Applied technology Classrooms

Current educational philosophy focuses on a learner-centered curriculum, which includes:

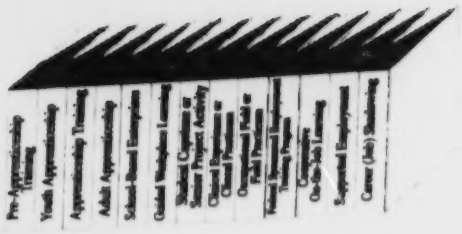
- the teacher as a facilitator (a guide on the side of students versus the sage on the stage);
- the student as a discoverer of knowledge within his or her learning community (listening to others, filtering information and drawing conclusions versus simply taking in a body of knowledge imparted by the teacher);
- the idea of learning from mistakes;
- use of the community as a resource;
- use of real-world learning experiences; and
- the application of learning in future employment and daily living.

Teaching to Student Diversity

It is becoming increasing clear that schools must be proactive in meeting the needs of students from diverse cultural backgrounds with varying abilities, disabilities, interests, experiences and other factors that effect their performance in school. Many instructional strategies that have been developed and used by teachers especially for students with special needs have proven effective, not only for those students, but with other students as well. It is important to all educators to be aware of characteristics of their diverse students and strategies that meet their varying and special needs.

Increasing ethnic and cultural diversity promises to continue enriching life in the United States. This has important implications for education. As diversity in the school population grows, it becomes more and more evident that all students regardless of their race, ethnicity, culture, and social economic group, must acquire the knowledge and competencies necessary for functioning effectively with one another. Current labor market data indicates that 80% of new jobs will be filled by women and minorities by 2010. All students must develop the knowledge and competencies necessary to participate successfully in the work force and in society.

Florida's system of School Improvement and Accountability Goal 3 Standard 10 reiterates the importance of this diversity in schools and the workplace.



Florida students appreciate their own culture and the culture of others, understand the concerns and perspectives of members of other ethnic groups, reject the stereotyping of themselves and others, and seek out and utilize the views of persons from diverse ethnic, social, and educational backgrounds.

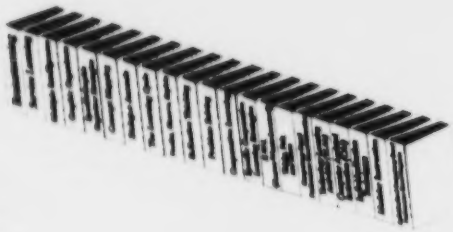
Florida's System of School Improvement and Accountability, Goal 3, Standard 10

Infusing a multicultural perspective

Not only does ethnic and cultural diversity enrich the American society, it also provides a basis for societal cohesiveness, and survival. It is essential that all members of our society and the future workforce understand the values and perspectives of international politics including business and industry practices influenced by racial, ethnic, and cultural groups. Schools are restructuring their curricula to include the infusion of multicultural perspectives into everyday instruction in all educational levels. Students with different cultural and family backgrounds, interests, and values working together on the same activity encourage students to develop a multicultural perspective. Students learn to understand and respect individual differences by understanding how others think and feel. Activities that promote empathy, understanding, negotiation, and respect for differing points of view promote a broadened perspective without negating one's own point of view. Students learn to view concepts, issues, events, and themes from the perspective of diverse ethnic and cultural groups. Because the classroom is a model community, students gain the experience of living as responsible citizens in a diverse, democratic society.

Adapting instruction for the diverse needs of learners

Given the focus on creating learner-centered classrooms, the unique characteristics of individual learners must guide curriculum planning, affecting both the learning environment and



the teacher's role. As we redesign the curriculum and the learning environment, and as teachers plan and facilitate learning, it is important to keep in mind that learners:

- are unique in personality, learning style and needs, and interests;
- come to the educational setting with different knowledge, experiences, and expectations about the world;
- come from many cultures and backgrounds;
- have diverse needs and values;
- are social beings;
- have a variety of interests;
- have a variety of opinions and ideas about school, the work place, applied technology, and the world.

Creating an effective learning environment that can address these diverse needs, backgrounds, and learning styles starts with understanding what those needs are. Teachers are the responsible daily designers of effective learning environments.

Adapting instruction for developmental differences

Students learn best when material is appropriate to their developmental level, while challenging to their intellectual, emotional, physical, and social development. Children grow through a series of definable, though not rigid, stages. Teachers should modify their activities to the developmental level of individual students. This requires awareness and understanding of developmental differences of children with special emotional, physical, or intellectual disabilities as well as those with special abilities.

Adapting instruction for the individual learning process

Adapting instruction and the learning environment for students with different needs can include challenging students with rich, open-ended problems to which they can respond on a variety of levels. Encouraging some students to explore more on their own and frequently reinforcing their discoveries can enhance their learning.

However, adapting instruction for those with special needs does not mean lowering

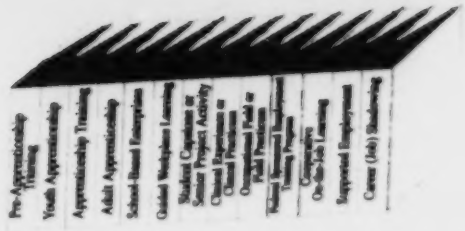
expectations or having different academic criteria. Teacher acceptance and high expectations for academic success play a major role in the way other students accept a student who has unique needs. This, in turn, can have a major impact on a child's self-image, affecting his eagerness and ability to learn.

Accommodating Students with Disabilities

Rule 6A-6.0312, FAC, Course Modifications for Exceptional Students, allows modifications to be made in basic or vocational courses. Educators may modify basic or vocational courses by: (1) increasing or decreasing the instructional time; (2) varying the instructional methodology; (3) using special communications systems; and, (4) modifying classroom and district test administration procedures and other evaluation procedures. Although modifications to the course description or student performance standards are not allowed for *basic* courses, the program requirements or student performance standards *may* be modified for *vocational* applied technology courses. When modifying the content or requirements for vocational applied technology courses, the particular outcomes and student performance standards which a student must master to earn credit must be specified on the student's IEP.

Educators may adjust the time for a student by allowing more time to complete an assignment or a course or adjusting the length of class assignments. The method of instruction may be modified by using a variety of media, specially designed materials such as those available through the Florida Department of Education, and different instructional strategies. Special communications systems may include the use of adaptive technology in the form of alternative communications systems. Test administration modifications may include allowing the student more time to complete the test, assisting the student to record responses, and providing a quiet testing area free of distractions.

Quite often, modifications that are effective for students with disabilities work well for other students in the class. Specially designed teaching strategies can be easily integrated into the context of the regular classroom to enhance the content being presented, to assist with assignments, and to organize the content being learned. Techniques for assessing learning including flexible scheduling, recorded answers, use of mechanical aids, use of computers and



other applied technology equipment, or revised formatting, may be helpful for all students. In addition, use of quality organizer tools, portfolios, projects, real work demonstrations, teamwork, role playing, and other assessment techniques benefit all students.

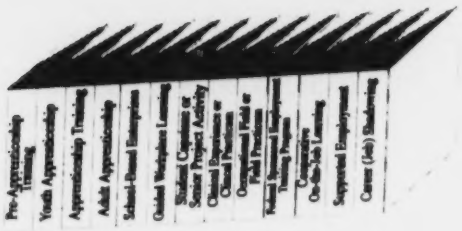
Accommodating the needs of students with disabilities may include many other modifications, depending on the local school population. For example, students with hearing impairments may need the assistance of an interpreter or note taker, or both in order to participate in class. Other students may need to use computerized devices for written and oral communication. Students with visual disabilities may require access to Braille and/or adaptive technology. For students who have difficulty with emotional control, precise rules, classroom structure, and behavioral expectations may need to be emphasized.

When the needs of learners with disabilities are accommodated by providing a supportive environment and modifying instructional methods, assessment methods, and the physical environment, such students are able to excel. They can develop a greater capacity to take an active role in the learning process and focus on their strengths, this achieving the appropriate level of knowledge, skills, and attitudes in applied technology.

Accommodating Limited English Proficient Students (LEP)

English for Speakers of Other Languages (ESOL) students are similar to students whose heritage language is English in many ways: they learn at different rates, have varied interests, backgrounds, learning characteristics, personalities, and knowledge and experiences. Language and culture add other dimensions to this uniqueness. Problems may surface because these learners may use one language at home while they are learning English at school.

There may be a psychological "pull" between two worlds. Because self-concept is influenced by the attitudes of others, negative attitudes from family, friends, and school personnel may result in ESOL students feeling isolated and overwhelmed with the new environment, new sounds, and new culture. Many things that are known to most literate English-speaking students may be foreign to ESOL students. An example might be the sign, "Fine for Loitering." If the ESOL student has learned the meaning for "fine" as "it is all right to do



something," the sign would convey an entirely different meaning than the idea of having to pay money for loitering. These concerns may cause barriers to learning.

From the perspective of the teacher, teaching a multilingual class requires more time and effort because all students probably have different background knowledge. Therefore, everything must be taught. Teachers cannot assume that students have the prior knowledge they need to learn the new concept or information efficiently. Teachers must be flexible, willing to learn and grow. They must be able to adapt and accept ESOL students, and convey an attitude of valuing others' languages and cultures. Many ESOL cultures have an entirely different view of education, including the role of the teacher and the student, the environment for learning, and the materials used, such as books, resources, and audiovisual materials. The teacher must respect these differing views and take them into account when planning instruction.

Appendix 4B contains a table of characteristics or behaviors and teacher strategies for improving performance of ESOL students. Teachers who understand and are sensitive to the needs of ESOL students and who use effective strategies to support them as they learn applied technology will provide successful experiences for these students. It is important to remember that these strategies may be introduced, extended, and expanded at all levels according to the interests and abilities of the learners.

Accommodating At-Risk Students

Students at risk of leaving school before graduation may be a special challenge to teachers. Poor academic performance as measured by grades, test scores, and grade retention, or excessive absence, and being overage-for-grade level are cited as the best indicators of potential dropouts. Students who have difficulty meeting the required academic performance levels and fall progressively behind their peers often see no hope to graduate.

Teachers can raise the level of student motivation and teach persistence by constantly modeling interest or creating an "applied" context in the subject, tasks, and connected

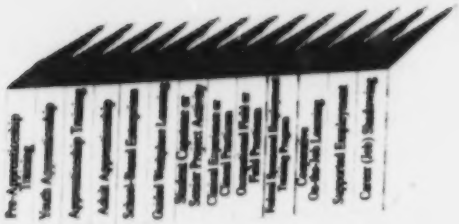
assignments. Ideas for tapping into the at-risk student's own intrinsic levels of motivation and setting up successful strategies for improving learning include many of the same strategies identified for ESOL students. Appendix 4C includes a list of several strategies that have been successful for students at-risk.

The Dropout Prevention Act of 1986, Section 230.2316, *Florida Statutes*, was enacted to authorize and encourage school boards to establish Dropout Prevention Programs. These programs are designed to meet the needs of students who are not effectively served by traditional programs in the public school system. They include students who are unmotivated, unsuccessful, truant, pregnant and/or parenting, substance abusers, disruptive, and adjudicated.

Strategies used in these dropout prevention programs that have been found to be effective are proving successful in more traditional settings. They include:

- competency-based curriculum which allows students to work at their own pace;
- career awareness and on-the-job training for employability skills;
- instructional strategies that include cooperative learning, computer-assisted instruction, multiple intelligences, authentic/alternative assessment, critical thinking, and graphic organizers;
- flexible scheduling or use of time; students "declare" a schedule and attend even though it may be beyond the traditional school day; competency-based curriculum delivered through computer-assisted instruction;
- experiential learning and hands-on activities;
- mentoring and nurturing.

In Florida, Blueprint for Career Preparation and Blueprint 2000 Schools at all levels have combined school-to-work and experimental learning for all students. Other successful programs for students including students at risk are in many different models. Community-As-School is a model in which students earn high school credit for an individualized curriculum earned through



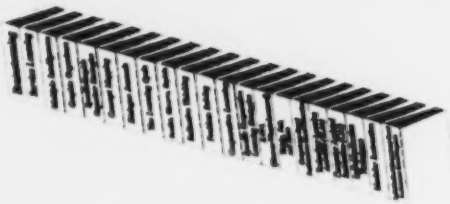
learning experiences in the community. Career Development Academies provide a school within-a-school integrated two to four year career focused curriculum, Tech prep programs, community-based schools, alternative schools, performance-based schools, and apprenticeships are models used in applied technology programs which have been particularly successful with students at-risk.

Course modifications provide needed flexibility in the delivery, assessment, and time dedicated to mastering subject area competencies required in courses. Use of modifications which provide interdisciplinary through transdisciplinary approaches in teaching are particularly effective for over-age-for-grade students. Utilization of course modifications which encourage performance-based learning and integration of subjects provide opportunities for at-risk students to catch up with their own grade peers.

Summer bridge programs also allow overage-for-grade students to catch up with their own grade peers by attending a rigorous summer session and then being promoted to the next grade level. This strategy works especially well with overage-for-grade seventh graders who are eligible for eighth grade promotion and have a personal desire for grade acceleration; after an intensive summer school program to acquire the necessary academic and personal skills for high school, they are promoted to the ninth grade.

Collaborative teaching has been found to enhance learning through activities geared to raise the students' academic performance by combining two classes. In one model, the dropout prevention teacher furnishes expertise in course content while the exceptional student education (ESE) specific learning disability teacher offers expertise in course modification. In another model, the dropout prevention teacher and technology education teacher combine classes, provide modifications and modularize learning in real world technology learning activities.

Other effective instructional practices for all students include thematic units in which teachers identify common themes and realign student performance standards to reflect the theme. In some thematic models, teachers work together to identify common concepts and connection



across disciplines. In others, teachers work separately without any attempt to connect with other subject areas, except to emphasize the theme during the same time block.

Peer counseling and student conflict mediation are also effective for all students especially those at-risk. One peer counseling model pairs at-risk ninth graders. The twelfth graders are selected according to leadership skills and role-model potential. They are trained in peer counseling strategies including listening, questioning, paraphrasing and feedback. The peer counselors also provide academic tutoring and the use of a variety of peer counseling strategies designed to help the ninth grader be successful in their entire curriculum. Peer counseling strategies address social, individual, school, and family concerns; topics may also include drug and alcohol abuse, family relations, academic motivation, and coping with stress. Student conflict mediation programs simulate a peer court process in which students mediate in behavioral and conflict situations. Often peers have been found to be more demanding of each other than the traditional adult administrator.

Special student support and assistance staff and programs in schools serve students at risk. Students are served in traditional classes through a flexible schedule of auxiliary services, including supplemental materials or alternative strategies to assist with course modification, behavior management, or assessment. Instructional aides, case managers, or resource officers also can be used to support teachers, students, and parents who need help with students at-risk.

The General Equivalency Diploma (GED)/High School Competency Test (HSCT) Exit Option allows currently-enrolled dropout-prevention students to earn a standard high school diploma. By enrolling in courses for credit which lead to a standard high school diploma, they work to master student performance standards. The learner must demonstrate probability for success on the GED through documentation of a high score on a standardized test. In addition, students must be behind the class with whom they entered kindergarten, pass the HSCT, and the GED tests to qualify for this option. Finally, students at-risk may be assisted through coordination with other agencies, such as social service, law enforcement, and juvenile justice agencies, as well as, community-based organizations.

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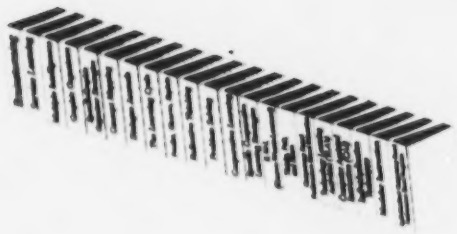

Key Chapter Concepts

Instruction that prepares students for the 21st century should address:

- high academic standards with expectations of high achievement for every student;
- a learner-centered curriculum with the teacher as a facilitator of learning;
- learning based on constructing meaningful concepts from acquisition and application of knowledge, skills, and attitudes in real-world contexts;
- connections within applied technology and across other domain relating applied technology to the students' world;
- active, hands-on learning in the classroom; write more student responsibility and choice;
- students inquiring, problem-solving, imagining, inventing, producing and finding answers;
- students working cooperatively, learning together;
- accommodating individual student needs, whether cultural, developmental, environmental, or cognitive;
- infusing a multicultural perspective;
- expanding resources to include local and global communities;
- using technology to support instruction;
- relating classroom learning to the skills students will need to function successfully in the work force and in society.

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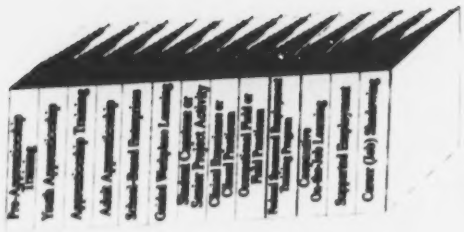
Applied Technology Selected Resources
Learning and Teaching



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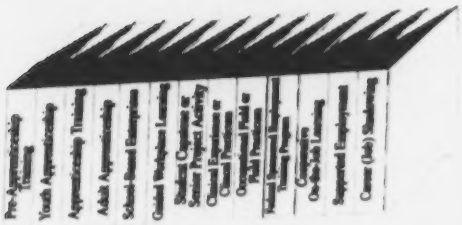

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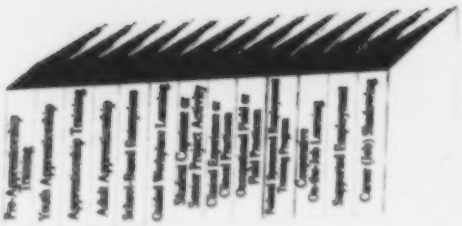

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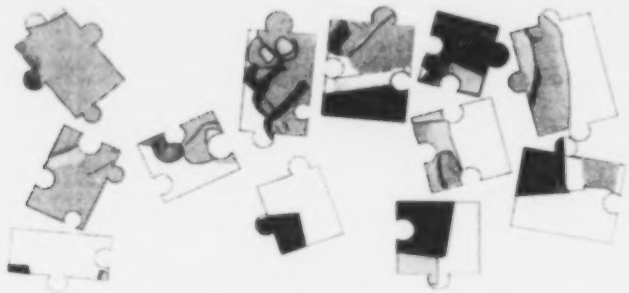


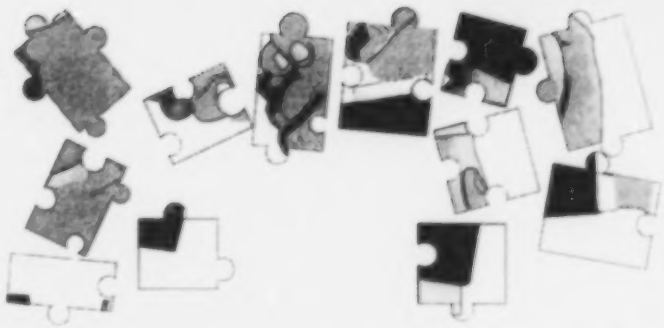
Chapter 5: Curricular Connections Through Instruction

Chapter Highlights

- **Curricular Connections**
- **Models for Curricular Connections in Instruction**
  - **Infusion**
  - **Parallel Instruction**
  - **Multidisciplinary Instruction**
  - **Transdisciplinary Instruction**
  - **Contextual Learning**
- **Organizational Models for Instructional Integration**
  - **Magnet Schools**
  - **School-Within-a-School—Career Academies**
  - **Career Cluster/Major**
  - **Senior Project/Capstone Experience**
  - **Tech Prep 2 +2 and 4+2 Models**
  - **Applied Technology Teachers on Interdisciplinary Teams**
  - **School-to-Work Models**
    - **~School Based Models**
    - **~Work Based Models**
    - **~Connecting Activities**
- **Planning an Interdisciplinary Unit**

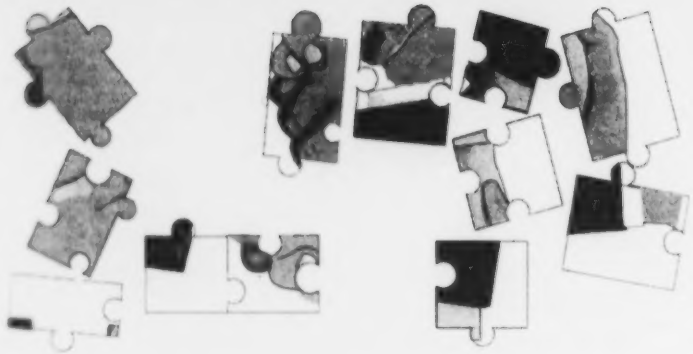
Why should applied technology be applied to other subject areas? There are many compelling reasons for doing so.

- **The public demands higher standards in education for all students**
- **Making connections among subject areas is more meaningful to students**



Higher standards in education for all students	
Challenges	**Effect**
➡ Legislative mandates	➡ More to teach with less or same time and money
➡ Knowledge increasing at a phenomenal rate	➡ Teaching must connect subjects and life
➡ World wide competition	➡ Increased need for training
➡ Access to world right now	➡ More stress in staying up-to-date
➡ All disciplines seeking to establish international standards	➡ Need updated technology
➡ Connections to life and workplace are expected	➡ Higher standards require changes for teachers

Making connections among subject areas is more meaningful to students	
Challenges	**Effects**
➡ Student benefits	➡ Teacher changes
➡ Facilitates and transfers learning	➡ Utilizes new methods
➡ Generates subject area of usefulness	➡ More planning
➡ Provides real world applications	➡ More time
	➡ Cooperation/collaboration
	➡ Uses community and workplace to provide context



A concept in applied technology might be closely related to concepts in the sciences. If so, why not address the concepts together in an integrated fashion? A process students learn in applied technology may help them better understand science. One example is the use of engine pulleys in an automotive class which can be applied to the concept of mechanical advantage in physics. It is important for teachers to make these "connections" with students.

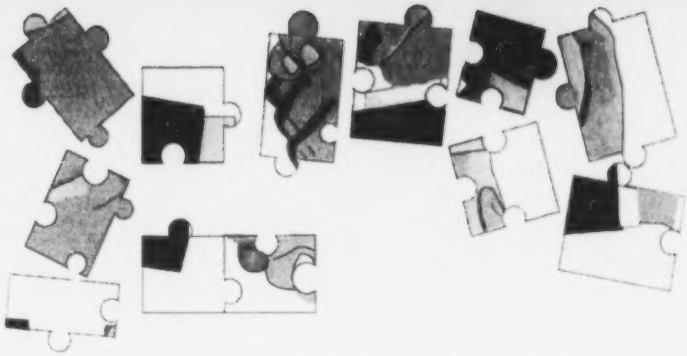
Curricular Connections and the Transfer of Learning

Connecting important concepts from different disciplines has several benefits. One of the most important benefits is that it facilitates the transfer of learning. Students frequently demonstrate that they understand something in one setting, but fail to understand that concept in another setting. Educators refer to this occurrence as a lack of transfer. For example, a student might show that he or she understands how to write a technical report when asked to write one in an applied technology class, but fails to see how the concepts used for writing the report applies to writing an essay in history class. By forging connections in the classroom, students have a better chance of recognizing that what they learn in school can be useful outside of school.

Another important benefit of curricular connections is that they encourage teachers to work together. When an applied technology teacher decides to use content from science, it establishes a reason for the applied technology teacher to interact with the science teacher. The interaction among teachers from different content areas can take many forms depending on the model that is being used for making curricular connections.

Models for Curricular Connections in Instruction

In this chapter, several strategies will be introduced which curriculum developers and teachers may want to explore in greater depth. Resources to assist teachers in connecting curriculum will be listed at the end of the chapter. The Southern Regional Education Board (SREB) has long supported academic and vocational integration through many different models. Those found in the academic literature may be labeled by different terms in the related literature found in vocational education.



Four effective instructional methods of academic and applied technology curricular connections are infusion, parallel instruction, multidisciplinary instruction, and transdisciplinary instruction. After further exploration of these models, individual school staff must determine which of these models will work in their setting.

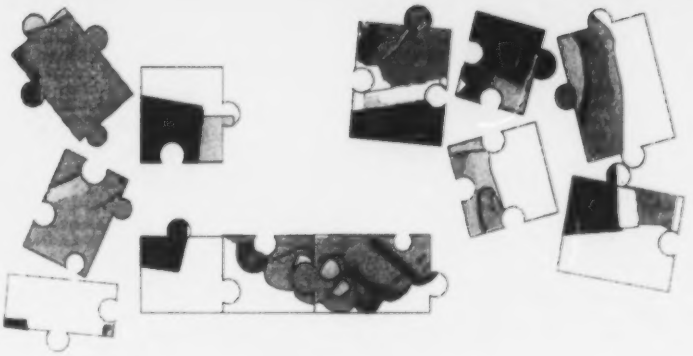
Infusion. In infusion, a teacher in a given subject area infuses another subject area into his or her instruction. Infusion is often referred to as a shared model, with academic instructional reinforcement of vocational concepts or vocational instructional reinforcement of academic concepts.

Parallel Instruction. In parallel instruction, teachers from different subject areas focus on the same theme, concept, or problem. Each discipline is taught separately, but the common theme, concept, or problem is addressed in each subject area during approximately the same time frame. Teachers must plan together to identify the common elements and determine how the concept, theme, or problem will be addressed in each subject area. Parallel Instruction is also referred to as a threaded model when each discipline focuses on the same theme or problem during the same time block at school. Homework and assignments commonly vary by subject area, but all reflect the common theme, project, problem, and concept being addressed.

Multidisciplinary Instruction. Within multidisciplinary instruction, two or more subject areas again address a common concept, theme, or problem. The subject areas are taught separately, for the most part, but a common assignment, homework, or project strongly links the various disciplines that are involved. Teachers must plan together to identify how the concept, theme, or problem will be addressed in each subject area. In addition they must construct the common project and determine how students will work together on the project.

Transdisciplinary Instruction. As in the first three models, within transdisciplinary instruction two or more subject areas address a common concept, theme, or problem. However, the subject areas are presented in a totally integrated fashion. Classes in the subject areas meet at a common time and place and teachers team-teach lessons. A major project often serves as the

focus of the unit. Teacher planning instruction, and assessment is now totally integrated across disciplines.



Contextual Learning

Contextual learning is a process model which allows the learner to become a problem solver. Contextual learning is appropriate at all levels and in all disciplines. It is the main method used in applied technology programs. The requirements for contextual learning include:

- Learning for acquisition of knowledge. (Students are involved in acquiring and retaining information to use in a real-life situation.)
- Learning for application. (Students process the information in the context of real-life situations that apply to everyday life.)
- Learning for assimilation. (Students demonstrate the ability to transfer and apply the knowledge and skills to new or other situations.)
- Learning for association. (The educational experience is organized around problems or themes instead of subject-matter disciplines; students can apply the learning to new problem-solving situations.)

Organizational Models for Instructional Integration

Magnet Schools

Middleton Middle School of Technology in Hillsborough County is an example of a Middle School Technology Magnet School. It is a school of choice for students and teachers alike. All teachers and students utilize technology in all of their classes in real life and work-based learning activities. The instruction includes all models of curriculum integration from infusion through transdisciplinary.

School-Within-a-School — Career Academies

The School-Within-a-School model typically requires a team of academic and career related teachers to work collaboratively with students within a career major or with a specific career emphasis over an extended number of years. The model is most frequently found at the high school level. Some of the characteristics of this model include focus on an industry cluster, common planning, a dedicated facility location, team teaching, team projects, and many different

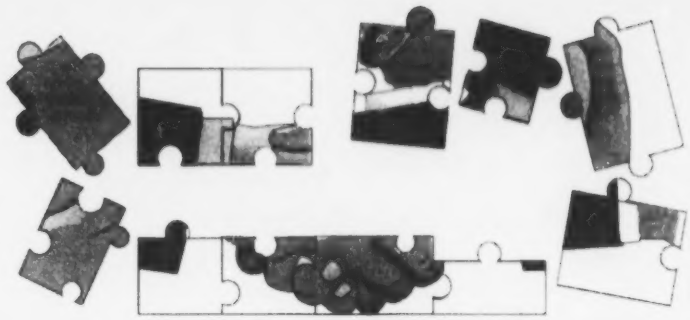
integration methods being used throughout the four year high school program. Since 1992, Florida has funded 30 district academies for career development. Many additional academies have been funded locally or through other resources. There is some indication that the school-within-a-school model is also being utilized at middle school, technical school, alternative schools, and in community college models. Weightman Middle School in Pasco County is designed as a school-within-a-school with different grades focusing on specific career areas. The emphasis is on interdisciplinary learning through projects and thematic activities. Frequently, the term school-within-a school is used interchangedly with career academy.

The School-Within-a-School-Career Academies strive to provide an applied curriculum with high expectations and higher level academic skills for all students. The academic subjects generally draw examples and problems to solve from the career major or industry upon which the program focuses. For example, the Medical Health Science Academy in Escambia County includes Latin as the foreign language for their academy and uses examples from the health occupations' field in teaching all of the academics in the academy.

Career Clusters/Career Majors

Students are encouraged to select a four to six year plan which includes a program of studies that is planned with appropriate level math, science, and other subjects to complement a student's career major or cluster. The models usually include the same academic core and applied technology program for students who plan to exit directly into the workforce and those who plan to acquire advanced technical training through an applied technical center, community college, or university. The major difference in the programs of study for students planning to attend a community college or university will include electives in foreign language and additional appropriate level academics. In St. Lucie County, the Tech Prep career majors' program has articulation agreements with Indian River Community College for associate degree programs; this allows students to complete their programs within a shorter time.

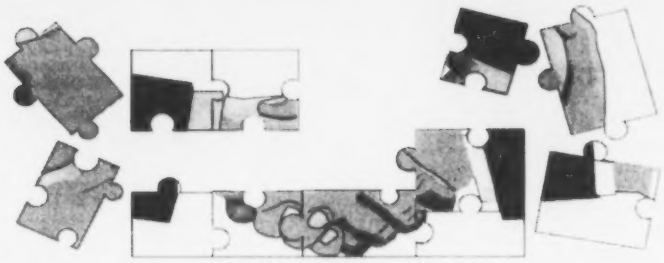
Senior Projects/Capstone Experiences



Senior projects/capstone experiences can be provided at the end of any benchmark level in education. It is a culminating experience chosen by the student to reinforce a special interest area of the student. The project must include the use of community resources, community or business experiences, as well as coordinated activities carried out by the student under the direction of the school or evaluation team of teachers. The evaluation team may also include business, industry, community, and parent representatives. At the middle school, the student's culminating capstone experience may be voluntary community service or a real world project of interest to the student. Typically, the student would complete the project and present the results to a team of evaluators or the school board. The presentation would demonstrate utilization of both academic and applied technology skills through a multimedia presentation of the student's learning. At the high school level, the senior project or capstone experience, would, ideally represent a student planned and an implemented long-term project of interest to the student for possible career pursuit. The activity may be voluntary or paid but should include experiences from entry through management level to increase the student's knowledge of workplace expectations and skills required for advancement in career fields. The culminating experience would include a public presentation of the learning experience through a multimedia presentation to a selected group in the community or evaluation team.

Tech Prep 2+2, 4+2 . . .

Tech Prep is a rigorous, challenging program of study that integrates higher-level academic and vocational/technical education, linking structured high school programs with two-year technical programs at postsecondary institutions to prepare students for a successful career while meeting the needs of business and industry. The program provides courses with a practical "hands-on" approach to learning. It requires students to obtain a foundation of higher level math, science, communication, and technology skills. The program offers students a focused, sequenced course of study consisting of at least two years of secondary and two years of



postsecondary or apprenticeship training with an option of two additional years leading to a baccalaureate degree, or four years of high school articulating to a vocational technical center or other combination (4+2 or 4+1+1). Tech prep encourages students to set career goals and lay out an educational road map to reach those goals.

Applied Tech Teachers Included on Interdisciplinary Teams

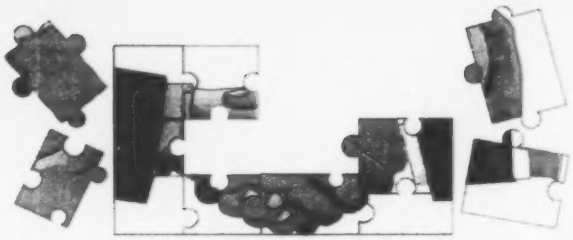
Typical middle school models place their teachers in teams who are assigned a portion of the student population. They become the students' primary teachers for their experience through middle school. Frequently, these teams do not include any elective or applied technology teachers. In schools where elective and applied technology teachers are tied into the core academic teams, there are indications of more contextual learning, more realistic projects, and increased connections to the real world.

Many secondary schools are moving toward a teaming approach similar to the middle school model. Often these teams are designed around career clusters or major areas of interest. Indications of increased student motivation, improved performance, and better preparation for the workforce are typical with the team approach in place.

School-to-Work Models

School-to-Work components include school-based learning, work-based learning, and connecting activities. The community, business, industry, community-based organizations, parents, educators, and students are primary partners in School-to-Work implementation.

School-Based Learning. School-based learning combines academics with real work applications. Academic and applied technology teachers work together in interdisciplinary teams to integrate academic lessons with lessons learned in the work place. Student progress is evaluated by what students know and what they are able to do. School-based learning also includes utilizing community members and business partners as resource persons in the classroom.



Work-Based Learning. In work-based learning, students participate in work in varying degrees ranging from "shadowing" various workers in several companies to volunteer work or internships to paid work experience. At the work place, students work closely with mentors, supervisors, and employers who advise and show the students what knowledge and skills are needed on a specific job and how to apply that knowledge and a critical thinking to perform the tasks in the workplace.

Planning an Interdisciplinary Unit

One of the most effective ways to plan a unit that fosters connections is to focus on creating projects that involve content from different subject areas. As we have seen, projects are a central part of both multidisciplinary and transdisciplinary instruction. Below is a simple three-step process that can be used to develop projects that forge curricular connections.

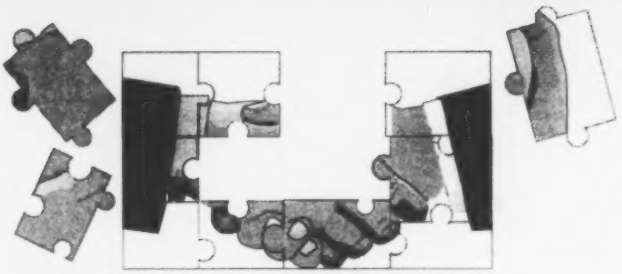
Step #1: Select benchmarks from two or more subject areas that will be integrated into the project.

For example, the teacher would first consult Chapter 3 of this document and Chapter 3 of the Language Arts Curriculum Frameworks document to find compatible benchmarks. One possible combination is:

> Applied Technology Benchmark (1.1.4.1) "Demonstrates ability to gather information from various sources to plan a project" and
>
> Language Arts Benchmark (L.A.A.2.3.5) "Locates, organizes, and interprets written information for a variety of purposes including classroom research, collaborative decision making, and performing a school or real-world task."

These two benchmarks—one from applied technology and one from language arts—would form the basis for the project. It is important to realize that all benchmarks must be selected with a great deal of attention to how they relate. The two benchmarks depicted are a good match. They both deal with gathering and interpreting information and creating a written document. If a teacher tries to force a connection between benchmarks from different content areas, the resulting project will be artificial and will run the risk of confusing students.

Step #2: Identify an interesting question or questions that can be asked about the benchmarks that have been selected.



One way to help learners explore the relationship between benchmarks is to ask a question that will naturally integrate the benchmarks. A list of useful questions might include:

- ✔ What is the underlying pattern?
- ✔ Is there a hidden relationship here? What is the abstract pattern or theme that is at the heart of the relationship?
- ✔ Are there different perspectives on an issue that should be explored?
- ✔ Is there a better way of doing something? Is there a new way of doing something?

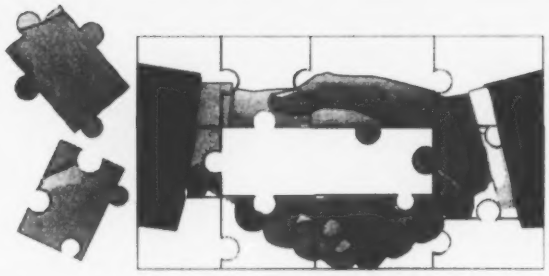
Source: Marzano, Pickering, McTighe. *Assessing Student Outcomes*. Alexandria, VA: Association for Supervision and Curriculum Development.

A question that seems to naturally address these benchmarks is, "Are there different perspectives on an issue that should be explored?" It would be logical for the applied technology teacher to emphasize to the students the language arts skills for creative and technical writing and the requirements of developing a good written planning document for industry.

Step #3: Identify a product or products that incorporate the benchmarks that have been selected. With the content benchmarks selected and an interesting question identified, the next step is to identify the product or products that best suit the project. It is useful to consider four types of products: 1) conclusions, 2) processes, 3) artifacts, and 4) affective responses.

Conclusions are generalizations that have been constructed as a natural consequence of studying some issue or topic. For example, in applied technology, students might produce conclusions about recommending stocks for investment as a result of studying annual reports of various companies. When students report their conclusions, they commonly are expected to provide evidence and support. This is usually done in the form of an oral report or written report; although, other media can be used including videotapes, audiotapes, charts, graphs, and the like.

Processes are sets of actions that are the natural consequence of solving a problem or accomplishing a goal. For example, in applied technology, students might be asked to develop a detailed process for developing their own written plan for investments. Processes are commonly demonstrated along with an explanation of how the process works and why it is effective. If the process cannot actually be demonstrated, it is sometimes simulated.



Artifacts are physical products that are natural consequences of solving a problem or accomplishing a goal. For example, in applied technology, students might be asked to create simulated portfolios for a prospective investor in stocks.

Affective Representations are illustrations of emotional responses that are a result of studying or working with some area or issue. They take many forms in applied technology including performance evaluations, letters of recommendations, recognition for outstanding customer relations skills, and evidence of documentation of exemplary work performance. In academic areas, they include personal essays, poems, sketches, dances, songs, and many other forms.

Of these four types of products, the artifact seems to be the one best suited for the project. With the benchmarks selected, an interesting question identified, and a type of product selected, the teacher would then write the project as a set of directions to the students. Those directions might read as follows:

1. Each team begins the game with $100,000 in cash and may borrow additional funds.

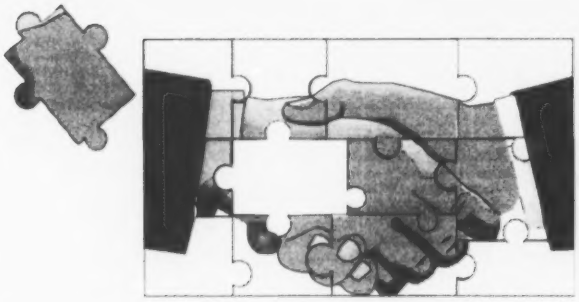
2. You may trade only those stocks listed in the Stock Market Game (SMG) Code Booklet (found in your team kit).

3. If a copy is delisted from an exchange (or for any reason no longer trades on that exchange), the computer will automatically liquidate positions in that stock and a Broker's Fee will NOT be charged.

4. All transactions are made on the basis of daily closing prices, which can be found in the NEXT DAY'S newspaper.

5. The date and day of transaction on the scan sheet must be the same as the postmark on the envelope. For example, if you code "Wednesday" on the transaction, it must be mailed on Wednesday. Transaction dates which differ from the postmark will have the transaction day changed to match the postmark or they will be returned to you unprocessed.

6. Scan sheets are provided in your team kit. The game is run on a Friday through Thursday "week." Teams may trade daily and, for each day you wish to trade,



transaction(s) must be completed on a scan sheet(s) and submitted to your teacher/advisor for SAME DAY MAILING AND POSTMARK.

7. Each scan sheet must show the team number and school name, and be signed by the team advisor. Your team number is indicated in your kit.

8. Make all transactions carefully. Your team will be held responsible for any errors made due to incorrect transactions or damaged sheets.

9. A record of a team's portfolio and transactions will be distributed weekly to schools, along with information for the advisor such as the rankings of participating teams in each region and state and a list of stock splits. A team will not receive a portfolio nor be listed in weekly regional rankings until its initial transaction is entered.

10. Team captains are responsible for making sure that proper records of transactions and portfolios are kept.

11. Stock dividends and splits are automatically computed into your portfolio. You should, however, check them for accuracy.

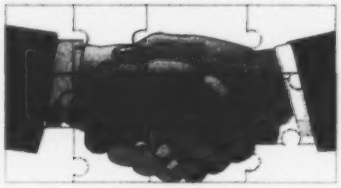
12. All Buy and Short Sell orders must be for a minimum of 100 shares (Round Lot). However, you may order Odd Lots in combination with Round Lot orders, such as 101, 326, etc. Sell and Short Cover orders for less than 100 shares will be permitted if an open Long or Short Position exists in the same number of shares.

13. The maximum number of shares you may trade of any stock on a particular day is limited to the total amount of that stock actually traded in the market that day.

14. Stocks trading below $5 per share are not available for Purchase or Short Sale. Such orders will be rejected. Sell or Short Cover transactions for EXISTING Long and Short Positions will be accepted, even if the price is less than $5 per share.

15. Any violation of the rules of the game may result in the invalidation of a transaction. Repeated violation of the rules may result in the disqualification of a team.

As this example illustrates, creating a project that involves benchmarks from different subject areas is a complex process. However, it is worth the effort in terms of student motivation and learning.



Key Chapter Points

- The academic literature identifies four basic ways in which curricular connections can be forged: infusion, parallel, multidisciplinary, and transdisciplinary
- Academic and vocational integration models include many different ways to develop and implement curricular connections.
- Contextual learning is a process that applies to all subjects.
- Magnet programs may be found at many levels including Pre-K through secondary.
- The school-within-a-school and career academy models require many of the characteristics of the transdisciplinary model.
- Career clusters or majors generally begin at the secondary level and go through post-secondary and college level education.
- Senior Projects or capstone experiences generally require field experience in the community or workplace and application of all subject area learning to the workplace and world.
- Tech Prep programs provide opportunities for all students to obtain advanced and college level opportunities through a seamless transition into career majors.
- Applied Technology teachers on interdisciplinary teams can assist all teachers to create more real life and workplace related connections.
- School-to-work models provide many additional opportunities for teachers, business, community, and industry to work toward the development of a world class workforce.
- There are many models for constructing projects that forge curricular connections.
- Curricular connections make learning more meaningful for students.

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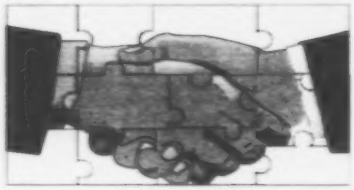

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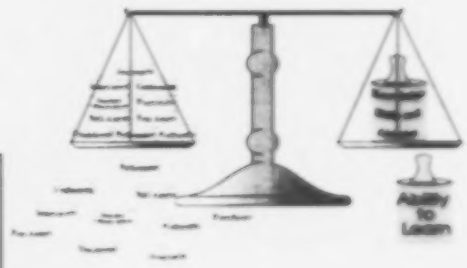
Chapter 6: Assessment



Chapter Highlights

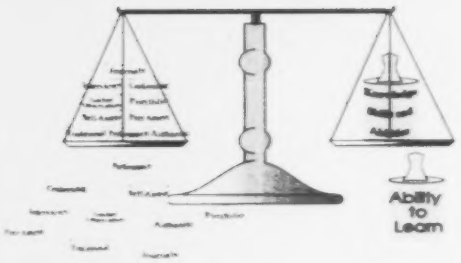
- **General Assessment Overview**
- **The Assessment Process**
- **Different Types of Classroom Assessment**
- **The Use of Assessment Rubrics**

General Assessment Overview

Assessment of student academic achievement is a fundamental component of *Florida's System of Educational Reform and Accountability*. Assessment provides essential information on the effectiveness of our educational reform efforts and on the level of students' achievement of Florida's academic standards. Assessment processes are varied and include the use of standardized tests as well as other formal and informal methods which provide useful information about student achievement.

Florida schools will be held accountable for student achievement through the collection and analysis of academic assessment information and the public reporting of results. One highly visible part of the educational accountability program will be a statewide system measuring student progress in reading, writing, and mathematics with an emphasis on problem-solving. The other discipline areas and examples found in the workplace and community will provide the context for assessment. The required statewide assessment will be administered at three levels: elementary, middle, and high school.

A statewide assessment program, however, is not adequate to provide all of the information on student skills needed at the local level. Additional information is needed to assure that students master the skills they need to enter advanced education opportunities and the workplace. This can be provided only through the proper use of classroom and work-based assessment procedures with real community and workplace involvement. Because of its



importance to education, the focus of this chapter is on assessment of student learning, one of the teacher's most complex and important responsibilities.

Overviews of various strategies for classroom, community, and work-based assessment are discussed. Curriculum and assessment developers and teachers should explore assessment strategies that provide for learning in context with life and work roles in greater depth. Assessments of both classroom and work-based activities also require involvement of School Improvement Teams including business, industry, and community leaders in planning and implementing appropriate strategies.

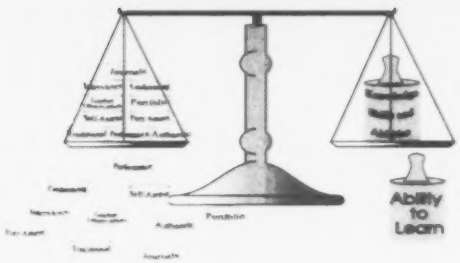
Classroom assessment refers to the tasks, activities, or procedures designed to obtain accurate information about student achievement in the school-based environment. From the teacher's perspective, assessment helps answer these questions:

- What do students know and what are they able to do?
- How does their learning connect to their interests? To other disciplines? To the community? To the workplace?
- How well am I teaching?
- What else can I do to help students learn?

From the student's perspective, assessment helps to answer:

- What do I know? What can I do?
- What more do I want and need to learn?
- Why is this important to me? In life? In other subjects? In the community? In the workplace?

Classroom assessment activities should be systematic, ongoing, and integrated into the process of instruction and learning. Effective assessment requires a continuous process of refining goals as the teacher works with the entire class and individual students. To assess also means to analyze critically and judge definitively. This meaning emphasizes the teacher's responsibility



to make judgments about students' achievement based on careful consideration of obtained information.

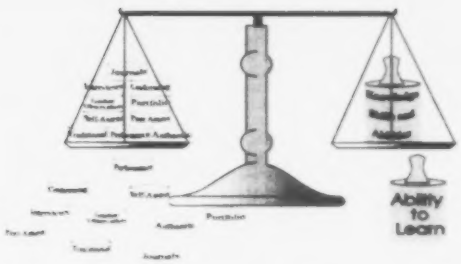
Authenticity in classroom assessment activities is desired whenever possible. That is, assessment activities should not only examine simple recall of information but should also determine the extent to which students have made sense of information. For example, can the students apply information to situations that require reasoning and critical thinking? Can they use their knowledge of applied technology to communicate their ideas and demonstrate their workplace competencies? Using authentic (i.e., realistic) assessment activities will help reveal the extent to which students have accomplished these skills. The strategies presented in this chapter will encourage the linkage of curriculum, instruction, and assessment and provide information that is as useful and valid as possible.

The Assessment Process

All students do not learn in the same way. Students who have differing learning styles typically have differing methods of demonstrating what they have learned. Use of a variety of assessment approaches is needed to allow all students to demonstrate what they have learned. The assessment process needs to include opportunities for input from business and community partners, parents, and the students. Timely feedback to students, parents, and other interested individuals is also important to positively impact student performance.

Different Types of Classroom Assessment

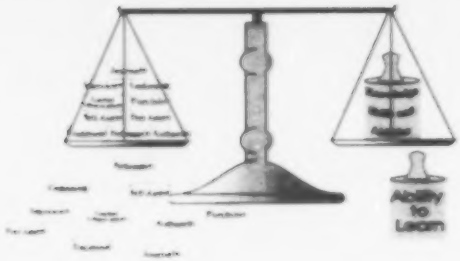
The unique nature of applied technology calls for using multiple forms of assessment to clearly understand each student's progress and to evaluate the impact of instructional strategies. Applied Technology curriculum applications and infusion at the Pre-K to fifth grade level are generally broad in scope. Workplace and community relevant projects, activities, and experiences provide students with awareness and limited exploratory experiences. Assessment techniques at the Pre-K through fifth grade level often include assessment techniques used in both the work place and in schools. At the middle school and beyond, the assessment methods used in applied technology parallel very closely those found in industries. Technical reports, portfolios, projects, peer evaluations, interviews, and computer applications are a few of the



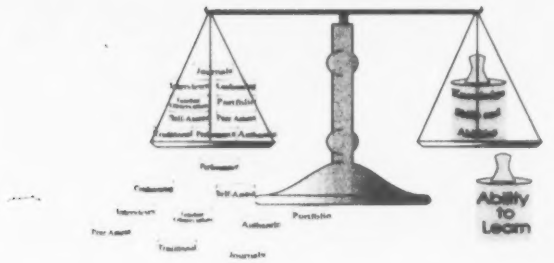
assessment types found in the workplace. Developing a variety of assessment options will allow the teacher to match the assessment to the individual student's ability. Using a variety of options allows students with different learning styles to demonstrate knowledge to verify that real learning has taken place.

Modifications that are made in the classroom for the instruction of special needs students often can be applied to assessment procedures and can be valuable for all learners. For example, a student who is expected to "write legibly" may, instead, be permitted to present written materials through use of a computer word processing program.

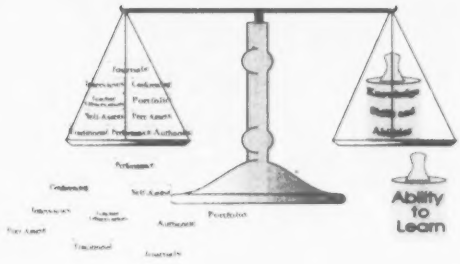
Assessment techniques overlap and blend together. Using several forms of assessment provides a broader and more comprehensive picture of the learning and teaching of applied technology. The tables on the following pages help to illustrate this point.



Method	Traditional Assessment Techniques		
	Used in School	**Used in Workplace Training**	**Used in Workplace**
I. **Written Assessment**			
Theory	✔	✔	✔
Multiple Choice	✔	✔	
Case Problems	✔	✔	✔
Short Answers	✔	✔	
II. **Practical Problem Solving Performance Assessment**			
Presentation Skills	✔	✔	
Management Decision-Making	✔	✔	✔
Cooperative Learning	✔	✔	✔
Role Playing	✔	✔	
Computer Applications	✔	✔	✔
Teacher Observation/Evaluation	✔	✔	
Employer Observation/Evaluation		✔	✔
Student and Peer Evaluation	✔	✔	✔
Work Experience		✔	✔
Project Performance Evaluation	✔	✔	✔



	Alternative Assessment Techniques	
Method	**School-Based**	**Work-Based**
I. **Written Assessment**		
Portfolio	✔	✔
Journal	✔	
Research Paper/Technical Report	✔	✔
II. **Performance Assessment**		
Presentation Skills	✔	✔
Competency-based Evaluation	✔	✔
Project Performance Evaluation	✔	✔
Computer Application	✔	✔
Demonstrations	✔	✔
Interviews	✔	✔
Self Assessment	✔	✔
Peer Assessment	✔	✔
Conferences	✔	✔
Self-Improvement Plan	✔	✔
Time Management Record	✔	✔



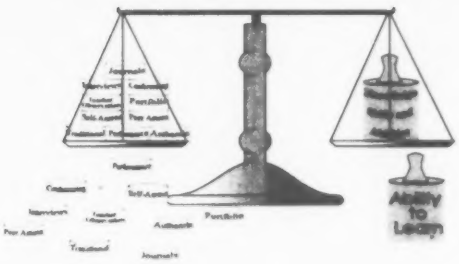
Traditional Assessment is a term often used to describe the means of gathering information on student learning through techniques such as multiple-choice, fill-in-the-blank, matching, questions, and essays. These approaches are particularly useful in assessing students' knowledge of information, concepts, and rules. They are also appropriate for assessing students' knowledge of the terms and processes involved in a particular industry or career.

Because factual knowledge of information is one important aspect of applied technology, carefully designed multiple-choice and matching questions can enable the teacher to quickly assess student mastery of the building blocks of the applied technology curriculum. Examples of such skills include the following: Can the student recognize important terms, relationships and symbols? Does the student recognize how knowledge is organized into patterns, how generalizations are formed from evidence, how events are understood in chronological order, how fact is different from opinion, how frames of reference inform decision making, and how predictions can be made from data? However, an effective assessment evaluates knowledge of facts as well as their connection to a broader body of knowledge. Proficiency in applied technology depends on the ability to know and integrate facts about all aspects of industry into useful constructs.

Assessment Alternatives. There are many "alternatives" to traditional assessment that can be used to broaden the scope of the teacher's classroom assessment activities. In some of these alternative forms, students perform self-evaluations of their work. In others, teachers, business persons, or community representatives make informal or formal observations about students' knowledge, skills, and performance that relate to subject-area, community, or work place related topics.

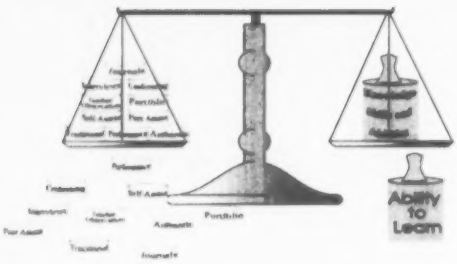
The following list of alternative assessment techniques is by no means exhaustive. New assessment techniques are continually being developed to measure students' progress toward achieving new performance standards and benchmarks.

- *Performance Assessments* require the student to troubleshoot and solve a problem, create a product, or construct a response that demonstrates a skill, process, or concept. Performance assessments are commonly presented to students as workplace related



projects that may be done over an extended period of time and require that students locate, gather, organize, and interpret information. Typically, the project or product of the assessment is rated by the teacher or team teachers using clearly delineated criteria rubrics that are in line with community and industry expectations or standards.

- *Authentic Assessments* are forms of performance assessment that are structured around real-life problems or work related situations. Although a traditional multiple-choice question can describe a real-life situation, the term "authentic assessment" usually is applied to performance assessments.
- *Teacher or Juried Observation* is a form of data collection in which the instructor or team observes students performing various activities without interrupting the students' work or thoughts. Teachers use checklists, rating scales, or notebooks to record their judgment about students' competence in specific standards or benchmarks.
- *Interviews* require students to respond verbally to specific oral questions. The instructor employer team or interviewer asks questions, interprets answers, and records results. This form of assessment also allows probing student answers for more complete responses and to identify any student misconceptions. Interviews may also be conducted by business or community representatives.
- *Conference or Conferencing* involves a two-way dialogue between a teacher and students or among students for the purpose of evaluating progress on a specific standard or benchmark or on a project. Conferencing may also be used to evaluate work-based learning and community service activities or projects.
- *Self-assessment* enables students to examine their own work and reflect upon their accomplishments, progress, and development. The teacher may supply the student with assessment criteria or assist students in developing their own criteria. This form of assessment assists students in developing the critical thinking and evaluative skills that lead to independent learning. Self-assessment tools used in industry to improve

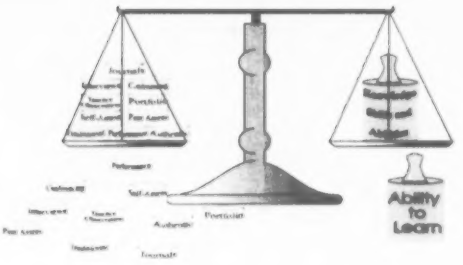


performance also benefit the student in the classroom.

- *Peer Assessment* involves students evaluating each other's work using objective criteria. It requires students to reflect on the accomplishments of their classmates. By assessing others' work, students often see alternative reasoning patterns and develop an appreciation for diverse ways of approaching and solving problems. Peer assessment and improvement strategies are used by many workplace teams to improve quality performance.
- *Portfolio Assessment* is a purposeful collection of a student's work that provides a long-term record of the student's best efforts, progress, and achievement in a given area. Materials included may be decided on by the student, the teacher, or both. Depending on the intent, portfolios can serve as the basis for assessing individual student growth over time on specific standards and benchmarks. Portfolios may also be used to assess learning specifically in a theme or unit in an academic, vocational, or career development area. Note that while a portfolio can be used as an effective instructional tool, its use as an assessment tool demands clear understanding of purpose, specification of the desired portfolio contents, and definition of the rating methods for the individual components.
- *Journals* are a form of record keeping in which students respond in writing to specific probes or questions from the teacher or teams. The probes focus student responses on knowledge or skills specific to a standard or benchmark. Journals of accomplishments can also be used informally to assess the development of applied technology skills. As with portfolios, whether or not a journal becomes an assessment tool depends upon how it is organized and evaluated.

Florida's Applied Technology Assessment Focus

Specific measures of effectiveness for applied technology programs are required in Florida through assessment. These measures are represented through documenting academic skills, workplace skill standards, consensus measures, and Florida Education and Training Placement Information Program:



- *Workplace Skill Standards*—skills and competencies recommended by the Secretary's Commission on Achieving Necessary Skills (SCANS) for the workplace, are nationally accepted as general skills required in all work places.

- *Consensus Measures*—the group of performance measures and associated targets arrived at by a consensus building process to satisfy the accountability requirements of all relevant laws. The aspects of program performance that are emphasized include program productivity, placement, basic skills' attainment/remediation, more advanced academic skill attainment, earnings of former students, and access to programs by members of targeted populations.

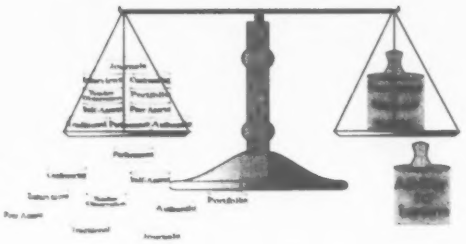
- *FETPIP* (Florida Education and Training Placement Information Program) is used to follow up all applied technology participants and assess program indicators.

The data supporting the Consensus Measurers and FETPIP are particularly important because they represent program "quality indicators."

The Use of Assessment Rubrics

An assessment rubric is a set of rules used to rate a student's proficiency on performance tasks (e.g., essays, short answer exercises, projects, portfolios, etc.). Rubrics can be thought of as scoring guides that permit consistency in assessment activities. A rubric often consists of a fixed scale describing levels of performance and a list of characteristics describing performance for each of the points on the scale. Alternatively, a rubric may describe different categories of performance that are not considered to be a "scale." Rubrics provide important information to students, teachers, parents, employers, and others interested in what students know and can do. Most often, scoring rubrics are developed by a teacher or team of teachers, but it may be desirable in some instances to involve students and employers in the creation of the rubrics. Different scoring rubrics are usually developed for each assessment activity, although if the activities are similar enough a single rubric can be applied common school-wide activities like oral presentations may best be taught and assessed with a common rubric used consistently by all teachers. The rubric should be known by students, teachers and employers.

A simple three-factor, four-point scoring rubric for a middle school student's family and consumer science project might look like this:



Factor 1: ***Adequacy of Material Content:***

Did I find ideas for food that were nutritious and tasty?

4 I was good at finding many ideas for overcoming the difficulty of serving food that is nutritious and also achieves my goal of serving tasty food at my party; I even created new ideas for food that tastes better than food that is less nutritious.

3 I found some good ideas for overcoming the difficulty of serving food that is nutritious and also achieved my goal of serving tasty food at my party.

2 I found ideas for serving food that has some, but not all of the qualities of nutritious food, or the food was nutritious, but not very tasty.

1 I found some ideas for serving food, but much of the food was either not nutritious or not very tasty.

Factor 2: ***Adequacy of Presentation*:**

4 I explained why people think that nutritious food tastes bad and gave several specific interesting examples of how this is not always true; I used ideas from my class project, but also added ideas from my own experiences.

3 I explained why people think that nutritious food tastes bad and gave examples from my project of how this is not always true.

2 I explained that people think that nutritious food tastes bad, but I did not give good examples of how this is not always true.

1 I talked about food, but really did not explain why people are sometimes wrong in thinking that nutritious food tastes bad.

Factor 3: ***Success in completing the assignment:***

4 I did a good job of noticing when the task was getting difficult and was creative at finding ways to not give up; I even tried things I knew would be difficult because I knew I could make myself stick with it.

3 I was good at not letting myself give up even when the task got difficult.

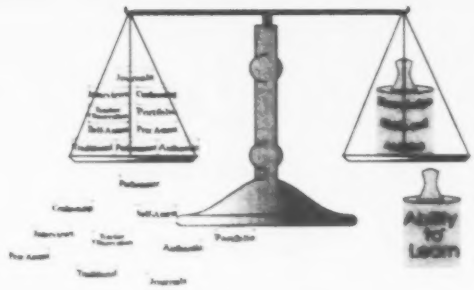
2 I sometimes gave up on parts of the task that got difficult.

1 I gave up when things got even a little difficult.

What Could Go Into an Applied Technology Portfolio?

A portfolio should capture the richness, depth, and breadth of a student's learning within the context of the applied technology instruction and the learning that takes place in the classroom, community, or workplace. Possible elements of a portfolio are as follows:

- ✔ Resume' (documentation of technical skill training, work experience, education, and community service, vocational skill awards and achievements),
- ✔ Documentation of SCANS skills and competencies,
- ✔ Documentation of applied technology skills gained in school, community, and workplace,
- ✔ Letters of recommendation (teachers, employers, business and community mentors),
- ✔ Samples of technical proficiency or projects completed,
- ✔ Employer or mentor evaluations,
- ✔ Certificates of training and awards,
- ✔ Documentation of program exit point or completion certificate,
- ✔ Occupational license or state board examination official scores,
- ✔ Workplace skill certificate,
- ✔ Videotapes of presentations on work-based or related activities,
- ✔ Photo essays of skill development in an industry or applied technology, and
- ✔ Copies of self and peer evaluations on teamwork and projects.



Key Chapter Points

- Assessment processes seek to measure students' acquisition and application of skills and all aspects of knowledge and its connections.
- Assessment activities in the classroom should be an integral, ongoing part of the instruction and learning process.
- Teachers should use a variety of assessment methods and modifications to address different learning styles and student needs.
- Teachers have a wide variety of options for collecting information on the degree to which students have acquired and can apply knowledge and skills specific to applied technology.
- Assessment techniques used in workplace training and the workplace are valuable for preparing learners for work and further education.
- Assessment activities will produce useful information to the degree that they are carefully planned, well organized, and consistently applied.
- Accurate assessment of students' achievement provides a sound basis for classroom instructional decisions.

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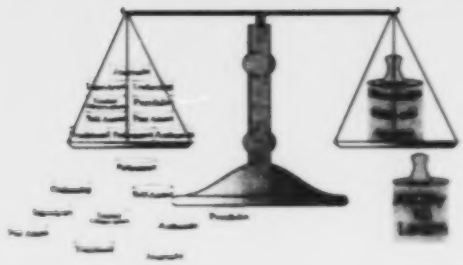
Applied Technology Selected Resources Assessment



Florida Department of Education. (1995, September). Florida's system of school improvement and accountability: Blueprint 2000. Tallahassee, FL: Florida Department of Education.

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Chapter 7: The Learning Environment

Chapter Highlights

- **Laboratory/Classroom Design**
- **Safety**
- **Scheduling**
- **Learning Resources**
- **Selection of Materials**
- **Using Technology**

The learning environment envisioned for the 21st century will promote learning closer to the real-world context. The learning environment will extend beyond the school into the home, workplace, community, and world. Learners will have the opportunity to work with local businesses and industry in job shadowing, job mentoring, internship, and other hands-on arrangements. People in the local community may be invited into the schools to share their knowledge, skills, and abilities, or to participate in class projects. Students can also have direct access to the global community via interactive media, the Internet, satellite transmissions, teleconferencing, and other technology, enabling them to work with other students and experts from other parts of the country or the world.

Teaching/Learning Facility Design

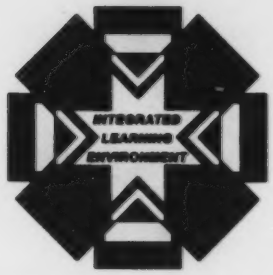
Teaching/learning facilities need to incorporate designs that allow for integrated instruction. At the pre-K through elementary level many classrooms are arranged to encourage integrated learning through focus centers and space arrangement to include areas that simulate real life mini-laboratories. For instance the reading center may resemble a children's library room, the science center may look like a laboratory with scientific equipment and student projects displayed, the art center may look like a mini-museum, and the writing center may have several networked computers available for young authors to write their first books. The computer center may also have computer simulations for improving problem-solving, creative thinking, and teamwork, as well as providing practice in several academic areas.

By the middle and higher levels, classrooms frequently resemble traditional lecture style rooms. Often all math, science or other areas are clustered together in hallways or separate buildings and begin focusing on individual subject areas without relating to other disciplines. Typically, applied technology programs are found in separate buildings away from the academic disciplines. The school facilities designed to keep the academic and vocational programs separate offers a challenge to educators because the process of disconnecting the learning associated with one subject area from another subject area has been strong. The subtle value placed on one subject area over another has also been a challenge. The tradition of keeping subject areas separate has tended to fragment learning and instruction by reducing the natural connections of the disciplines to real life and workplace requirements.

Teaching and learning environments need to be redesigned to provide access to all students to the technologies required in the workplace. Using an integrated curriculum with project experience rotation planned into the curriculum, all students can have access to the technologies required in the workplace. At the middle school level, exploratory work place and service learning experiences for all students may be planned through academic and vocationally integrated teams. The community and parents have an important role in providing recommendations for the real life and workplace exploratory experiences they feel are important in their community.

The technology, health occupations, family and consumer science, business, marketing, agriculture, and public service education teachers are typically applied learning specialists. The applied technology teachers bring a wealth of real life and workplace related projects and activities to the team. By co-locating academic team members in close proximity to their applied technology team members and facilities, all students benefit from access to a simulated workplace related and real life learning activities.

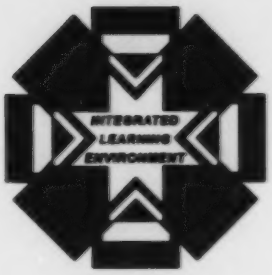
At the secondary and post-secondary levels efforts to co-locate teams including academic teachers with applied technology teachers and programs need to be expanded. Industry plays an important role in providing input on the aspects of their industry which are critical to successful employment and career development in the area. Time and space for integrated learning and transdisciplinary projects require large and flexible learning environments. With a group of 100



to 200 students, three to six teachers on a team should be able to simulate the work environment for a broad industry or career area. Co-location of teachers and students is important for success. Industry has a vital role in developing validation requirements for applied technology programs. Facility design, equipment, resources, curriculum experiences, and technology are areas in which local advisory committee members from industry can provide major assistance. Industry members may also work as team teachers and guest speakers or consultants on the curriculum. Florida has many examples of industry involvement in secondary and post-secondary education programs that have become outstanding practices cited in the literature on "best practices" in Florida classrooms. Through an experiential curriculum with school, workplace, and connecting activities, academic and workplace skills of all students have improved in schools which have student-centered faculty teams working cooperatively to support the academic and skill requirements for a career cluster curriculum area.

Because applied technology covers such a wide variety of learning and educational activities, there is not a generic facility/laboratory that accommodates all areas of applied technology. Marketing can generally use a more traditional space if there is enough space for free and flexible movement for cooperative learning and projects; therefore, it may be co-located easily with a team of academic teachers. However, business operations require a facility that simulates an office environment. Such facilities also must provide the space, electrical requirements, and access to the global community via computers, Internet, satellite transmissions, teleconferencing, and other technologies. State Requirements for Educational Facilities (SREF) manual based on Florida Statutes Chapter 6A-2 describe the facilities' requirements for agribusiness and natural resources; business technology; family and consumer science; services including health and medical, industrial, and public; diversified; and technology education programs. In all cases, the above areas follow Florida's A-Z minimum requirement for laboratory setting found in the Florida statutes including sufficient storage, instructional, and planning space. In many cases, additional rooms are required for specific curricula such as video production/darkrooms, electronics, manufacturing cells, business operations, transportation, and project storage. In agriculture, outside plots of land may be needed as well as storage rooms for large equipment and machinery and dry storage for fertilizers and chemicals. Academics and

other integrated environments are fostered by providing large, flexible facilities, so that students may be grouped for teams seminars or projects.



Goal 4: Communities provide an environment that is drug-free and protects students' health, safety, and civil rights.

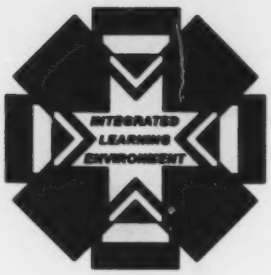
Florida's System of School Improvement and Accountability

To provide effective instruction for all students, it is crucial to address the needs and special requirements of students with disabilities. The Americans With Disabilities Act describes people as with disabilities as those who have a physical or mental impairment that substantially limits one or more major life activities. Educators should become familiar with the legal requirements for providing for students with disabilities [Public Law 94-142 and Public Law 101-336 ADA, Section 504 of the Rehabilitation Act of 1973] which state that classrooms must accommodate students with disabilities. Examples of adaptations to the classroom, gym, applied technology facilities, or school grounds might include ramps and raised work spaces for students who use wheelchairs, quiet areas for students who are easily disrupted by noise or visual stimulation, and sufficient lighting for students with visual impairment. Teachers must be aware that Title VI, of the Civil Rights Act of 1964 and the Florida Educational Equity Act FS 228-200 of 1984 require that criteria for admission to a program or course will not have the effect of restricting access by persons of a particular race, national origin, sex, disability, or mental status.

Teachers also need a carefully designed space for planning, teacher collaboration, inquiry, and research. The elements considered in the physical design of classrooms can apply in designing the teacher or teacher teams space as well, including providing easy access, appropriate wiring, and equipment such as computers with access to the Internet and telephones.

Local school districts have many factors to consider when they evaluate what is needed to improve the design of their school's applied technology facilities. Local needs and goals, budgets, instructional methods, adaptations to meet the needs of individual students, potential changes in student enrollment, wiring for technology, learning environment/ergonomics, local

industry needs, and flexibility to allow for changes to meet new conditions in the future are a few of the many issues to consider when designing or redesigning facilities for applied technology and integrated curriculum. Local officials also need to consider equipment, facility specifications, architectural planning, bidding, contracting, and post-occupancy evaluation.



Safety

A safe, secure learning environment for all students is a priority. One aspect of school safety involves the physical environment. The environment should be free of odors, allergens, and harmful chemicals such as asbestos. To provide safety in the physical environment for students with disabilities, adaptations such as flashing fire alarms, well-marked exits, and special procedures for evacuation are necessary. A second aspect of school safety involves the supervision of students. Teachers must be aware of and understand safety procedures inside the school facilities, on school grounds, on field trips, and at special school events. A third aspect of safety is the responsibility of the whole school community for providing an environment in which everyone is safe from verbal, physical, and psychological harm. Teachers should also be prepared to use strategies for crisis intervention and conflict resolution. Depending on the specific applied technology programs offered, very specific safety rules and procedures must be designed and implemented.

Schools will incorporate safety and health practices into the school environment. References specifying safety policies, OSHA regulations, and incorporating state and federal policies must be available for applied technology laboratories. Some applied technology programs may require additional electricity cut off master switches, fire extinguishers, safety showers and special clothing.

Goal 5: School boards provide a learning environment conducive to teaching and learning.

Florida's System of School Improvement and Accountability

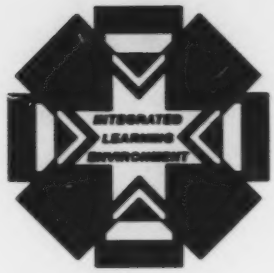
Scheduling

Adequate time is essential for quality instruction and learning so that students achieve high academic standards. Students need sufficient time, free from interruptions, for concentrated involvement in learning experiences or projects. Students may also need time for extended research design, discussion, experimentation, comprehension, and reflection.

Teachers also need time to work with their colleagues, to discuss and make decisions about those matters that affect their work and that of their students such as teaching materials, standards for student assessment, and structures for specific learning experiences. Florida's education reform envisions that a strong element of school-wide problem solving and improvement will be provided by the local school community. This will involve teachers in new activities. Teachers need time to research the effectiveness of instructional strategies, to plan cooperatively, and to develop integrated, meaningful lesson plans. Teachers also need time for conferencing with employers, other teachers, counselors, psychologists, and administrators and for communicating with parents.

Another aspect of scheduling involves the range of teacher responsibilities and class size which can have a significant impact on the classroom environment. The appropriate work load for teachers or the appropriate class size differs for schools and districts depending on several factors. Generally, an acceptable range is established at the district level, taking into consideration the characteristics of the unique student population, the composition of individual classes, funding levels, current and planned educational reforms, extra duties and activities teachers undertake, and the organization and administration of the school.

Local school districts and schools may wish to investigate ways to amend their present time structures. New ways of structuring time are being employed so that time can be used more



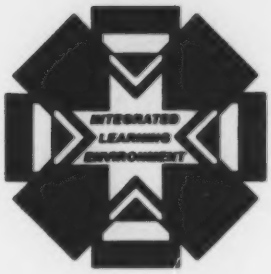
creatively as a flexible resource. Many districts are adopting block scheduling, implementing year-round calendars, combining courses, and using other strategies to improve time usage. In middle schools and many high schools, students and teachers may be grouped into teams which articulate curriculum throughout the middle or high school experience.

Learning Resources

Classrooms today are alive with activity and use a broad range of resources that may include construction paper and crayons, baby food jars, buttons and other manipulatives, newspapers, films, computers, real work related objects, multi-level computer assisted instruction at many levels, textbooks, electronic encyclopedias, graphing calculators, equipment and software for teleconferencing and satellite equipment, industrial electronic simulators, and sophisticated laboratory instruments. There may be colorful displays on the walls, a variety of primary and secondary source materials including technical manuals, electronic aids, art prints and music, and an inventory of specialized applied technology equipment set up in simulated workplace environment. Computer stations with multimedia capabilities, up-to-date instructional materials, and software are used in both academic and applied technology classrooms to assist research and production of learning products and encourage active and authentic learning both for individuals and student work teams.

Instructional materials and equipment for students with special needs are designed to enable students to compensate for their limitations. For students with visual impairments, Braille and large print books can be obtained through the Florida Instructional Materials Center. Closed-captioned videos for students with hearing impairments are developed at the Florida School for the Deaf and the Blind. Other special adaptive and assisting technology is available.

To help students manage their own learning, educators can offer a cadre of information at varied reading level using more than one format. Special learning guides and tools can also enhance the educational experience. As with instructional modifications, these specialized materials can often benefit students who are experiencing learning difficulties, but who do not qualify for exceptional student education programs.



Selection of Materials

Teacher involvement in the selection of applied technology instructional materials that effectively support the development of critical thinking skills and problem solving is a critical factor in course/program development. Whenever possible, teachers and appropriate business persons must be involved in the selection of textbooks and other major purchases for applied technology programs in the school or district. In addition, applied technology teachers and program advisory committee members must have more freedom to select supplementary trade books, reference materials, audiovisual materials, computer software, multimedia equipment/ hardware, and other teaching materials and supplies.

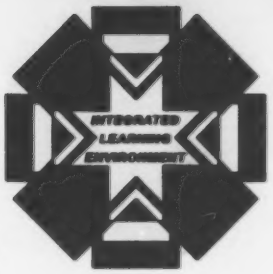
Educators should base their selection of instructional materials on the applied technology instructional plan, employer concerns, and the specific needs of the students. Educators and employers should examine the content and presentation of the materials from many different perspectives including the vision and goals of the local school, the goals of their specific program, and the school budget. Educators should refer to state guidelines and district policies when evaluating and selecting specific materials.

Technologies

The increasing use of technologies is already transforming the world of business and industry as well as our schools. Training for both educators and students in the use of technology has become integral to improved instruction. Although technology is not an end in itself, it is a powerful tool for student attainment of Florida's high academic and workplace skill standards.

The application of applied technology in the classroom can benefit students in a multitude of ways. For example it can:

- Give students more control and involvement in their own learning process;
- Promote investigative skills;
- Serve as an access to major sources of information;
- Provide students with skills to measure, monitor, and improve their own performance and to develop competencies for the workplace;
- Make learning more interesting for students;



- Enable students to communicate as a team in work place settings;
- Enable students to communicate with people from many parts of the world, bringing the sights, sounds, and thoughts of another language, culture and industry into the classroom;
- Provide opportunities to apply knowledge being learned in simulated or real-life projects; and
- Prepare students for success in a high-tech work world.

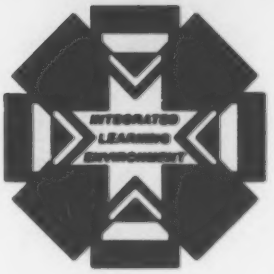
Technology transforms the classroom/laboratory into a multimedia learning center, giving teachers and students interactive access to word processing, presentation tools, graphics, media integration, desktop publishing, and telecommunications resources.

Distance Learning Technologies

Distance learning uses communications technology to bring teaching and learning together through the transmission of information or expertise from one location to another. Use of this technology allows students to interact directly with teachers, industry authorities, and students outside their community.

Distance learning technologies are a valuable resource for applied technology, because they can enrich and enhance the learning experience for all students. Using the same technology that distributes most broadcast and cables TV signals, satellite-based distance learning services can economically reach hundreds or thousands of receiving sites located all over the United States. Some cable companies have developed special services targeted specifically to educators and students. Through microwave systems, fiber optic cables, and the Internet, distance learning programming can be more readily distributed to remote areas.

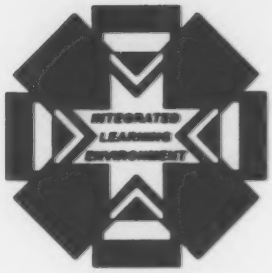
Educators with a computer and a modem can access an increasingly large selection of on-line data resources and dial-up bulletin boards. These services typically offer electronic mail, research databases, forums, and discussion groups for a variety of special interests. Advancing rapidly on the technology horizon is the use of live video-conferencing over an electronic on-line network. Live, interactive videos can take students on electronic "field trips," from the bottom of the ocean, to the rain forests, to the Arctic, and to outer space.



Using telecommunications, students in Clearwater can exchange ideas with students in Ocala, Miami, Pensacola, communities in other states or countries. An international marketing class in Miami may communicate with a class in Japan or a company in Sweden. Students in several schools throughout the state may participate in an on-line stock market project simultaneously. Students in Florida may communicate with students in Australia comparing agricultural production and environmental pests or problems effecting the food supply to their country. These are typical experiences happening right now in schools across the country.

As technology evolves, it will be essential to evaluate which new tools will be most useful in the educational setting. Educators will need to be knowledgeable of technologies and their applications in order to select appropriate technology to meet the diverse needs of students. Computer equipment and software selections for the applied technology program must include careful consideration of the applied technology program goals and needs as well as exiting equipment compatibility. New equipment and computer programs become available at a rapid rate; thus, the best choice for today may be quickly outmoded. On the other hand, waiting too long to invest in new educational technology will only put students further behind. Recommendations for specific hardware or software programs should be flexible, forward thinking, and based on extensive research. Teachers must make a commitment to become personally competent in using technology in education. Teachers need to continually improve their technology skills by keeping up with new developments and exploring the further capabilities of available technology. Appropriate training and support opportunities should be available.

The age of technology affords educators a wealth of choices. As technology expands into education, applied technology educators can discover new ways to explore applied technology learning and improve student performance. The availability and appropriate use of technology are indispensable in developing programs that will prepare the students of today to perform better in post-secondary and specialized training, face the continual advancements in the workplace, and to meet the technological changes that will occur in the twenty-first century.



Key Chapter Points

- Community resources and the latest technology should be tapped to bring the world into schools. Students need to learn in the real-world context.
- Effective classroom/laboratories are ergonomically planned to provide simulated work place settings. Changes in student enrollments, student abilities, budgets, instructional needs, and the goals of the applied technology program will be taken into consideration.
- Safe, secure learning environment free from violence, the fear of violence, drugs, disorder, disruption, and discrimination is provided for all students.
- Time can be used creatively as a flexible resource so that there is an opportunity for learning to occur naturally and authentically.
- Classroom/laboratories should be rich with learning resources that afford opportunities for observation, manipulation of objects, exploration, experimentation, and discussion.
- Selection of instructional/technological materials supports contextual and applied learning.
- Technology provides applied technology educators new ways to explore ideas and meet the individual needs of students.
- Planning for future flexibility — requires aiming for facilities to accommodate future technology.

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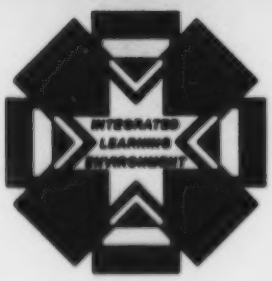

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Chapter 8: Professional Development

Chapter Highlights

- **Importance of Professional Development**
- **Preservice Education for Classroom Teachers**
- **Effective Professional Development**
- **An Effective Professional Development Program**
- **Commitment to Lifelong Learning**
- **Attributes of the Professional Educator**

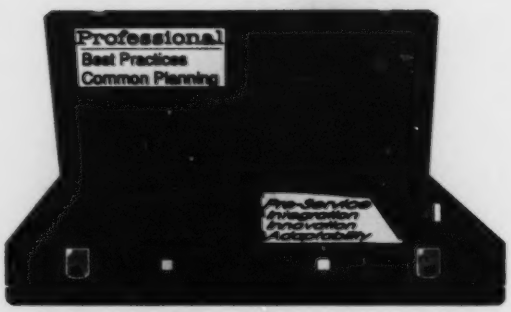
The Importance of Professional Development

Professional development is a continuous improvement process lasting from the time an individual decides to enter education until retirement. It encompasses the processes that educators engage in to initially prepare themselves, continuously update themselves, and review and reflect on their own performance. Just as knowledge and skill requirements are changing for Florida students, so, too, are those for Florida educators. The globalization of commerce and industry and the explosive growth of technology and subject area knowledge demand that teachers continually acquire new knowledge and skills. In *The Seven Habits of Highly Effective People,* Steven Covey suggests, "Begin with the end in mind." If educators are to successfully prepare students for the future, they must be prepared for the future themselves. Schools and districts must be committed to offering the highest quality professional development opportunities for their teachers. Learning opportunities must be provided in which preservice teachers as well as more experienced teachers can develop or acquire the necessary knowledge and skills to deal with change and pursue lifelong learning.

Preservice Education for Classroom Teachers

Preservice education encompasses the training, preparation, and courses required of teachers for certification. Research in schools across the nation shows that a crucial component of restructuring education is improved teacher preparation programs. Restructuring requires a new model for preparing teachers. Preservice education must develop a teacher's capacity for

facilitating student learning and for being responsive to students, community needs, and business/industry interests and concerns (Darling-Hammond, 1993). Teachers also must be able to emphasize the skills and knowledge needed for the work place. Teacher education programs at the college/university level must be full partners in facilitating the following:

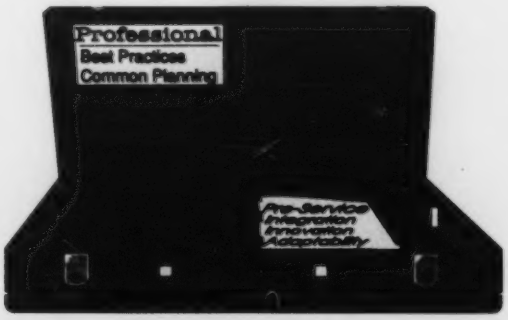


- Courses that develop a broad base of competencies, content area knowledge, and experiences for incoming educators;
- Both theory and practice in teaching a diversity of students including students with special needs;
- Practical, proven, up-to-date approaches to providing quality curriculum, instruction, and assessment;
- Training in the evaluation, development, and selection of instructional materials, instructional technology, and technology applications for the work place;
- Skills in collaborative and interdisciplinary teaching;
- Training to nurture the academic, emotional, and physical development of students;
- Training in contextual learning and workplace skills;
- Connecting theory to application through industry related experiences;
- Experiences that develop effective communication, team-building, and conferencing skills with both students and other education partners;
- Extensive and ongoing student-teaching experiences supervised by qualified teachers and college or university personnel; and
- Continuous professional growth throughout teaching careers and teachers who are proactive in seeking resources, assistance, and opportunities for growth.

(Note: The above list is, in part, from Sarason, *The Case for Change: Rethinking the Preparation of Educators*, 1993.)

- Using current research and "best practices" in teaching and learning, teacher education programs must be oriented toward producing creative, motivated, knowledgeable, confident, and

technologically literate beginning teachers, who relate learning to the real world and who are committed to lifelong growth.



Effective Professional Development for Classroom Teachers

As used here, the term "professional development" is defined as those processes that improve and enhance the job-related knowledge and skills of practicing teachers. Professional development provides the continuous, on-the-job training and support needed to improve teaching. Florida's school improvement initiative encourages local districts and schools to assume greater responsibility for professional development programs to serve local school improvement efforts. The following chart contrasts the differences in twentieth and twenty-first century school.

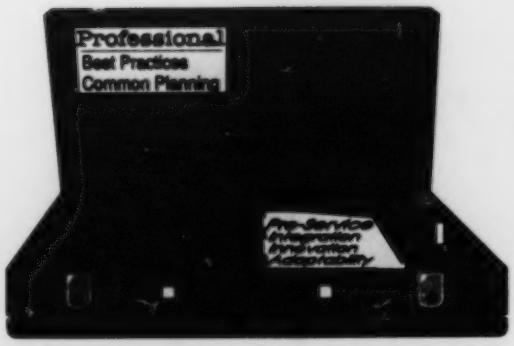
In-Service Model or Adaptive Change Model	
Traditional In-Service	**Adaptive to Change**
◆ Intermittent learning	◆ Continuous learning
◆ Workshop based	◆ Inquiry, just-in-time based
◆ Outside > in	◆ Inside > out
◆ Expert driven	◆ Learner driven
◆ Depends on individual to implement change	◆ Teams collaborate to innovate
◆ Individuals change	◆ All change
◆ Isolation	◆ Interdependence
◆ I, me, mine	◆ We, ours, us
◆ Autonomy	◆ Community

Those educators charged with the design of these programs are urged to reflect upon the following characteristics of useful professional development.

An effective professional development program:

- **Actively engages educators in the improvement process** — One facet of Florida's System of School Improvement and Accountability is to encourage local needs assessments, problem solving, planning and decision making in which teams of educators, identify needs, clarify goals, plan programs, monitor them, and make adjustments. Once needs are identified to improve student performance,

administrators and planners should use teacher expertise, wherever possible, in the preparation, development, and delivery of targeted professional development programs.

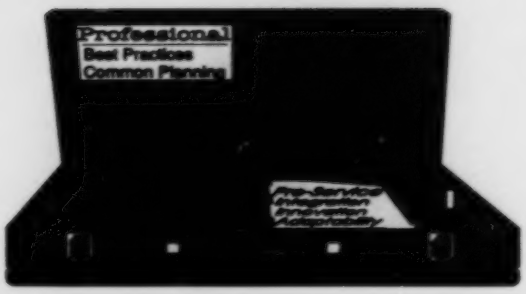


- **Continually updates the teacher's knowledge base and awareness** — Professional development programs must provide teachers with new knowledge and skills so that they remain current in content and in best practices. Educators also need ongoing training in the use of educational technology, as well as, information in technology in the work place. Professional development program planners must ensure that teachers receive training that will enable them to assess students in the learning process despite differences in their cultural and/or economic backgrounds.

- **Provides professional training for teachers whose curriculum has changed due to changes in technology** — Applied technology and work force development for current and emerging industries requires teachers for careers in an industry to stay current in all technical skills, laws, and processes required by the industry. The technical advisory committees for the various applied technology programs perform a critical role in advising teachers, administrators, and students of changes in technology and occupational skill requirements. Business and industry advisory committee members are full partners in the continuing improvement of quality programs by assuring the teachers are given timely updates of needed changes. Advisory committee input, field-based training, frequent returns to industry, training provided through professional associations, and training provided by industrial equipment suppliers is important to the various career related programs.

- **Establishes a collaborative environment based on professional inquiry** — Effective professional development emphasizes a team approach. Peter Senge suggests that problems facing education, business, and industry are too intense to be solved by one person. Teachers too must achieve INTERDEPENDENCE with others in the workplace. Professional development strategies are most likely to be successful when teachers are encouraged to reflect on their own practices, identify problems and possible solutions, share ideas about instruction, engage in scholarly reading and research, and try out new strategies in their classrooms to see how they work. Staff networking, clinical education partnerships with universities in peer coaching, business industry partnerships and training, and mentoring are important tools in long-range professional development planning. Peer coaching, where teachers help each other, offers a non-threatening environment in which teachers can implement new techniques and ideas and receive collegial feedback. Mentoring can

be especially beneficial to new teachers; this mutually beneficial relationship with an experienced educator might include an exchange of teaching materials and information, observation and assistance with classroom skills, or field-testing of new teaching methods.



- **Is continuously improved by follow-up** — Professional development inservice is targeted which provides a continuous process for learning, implementation, and follow-up. It is not a selection of isolated presentations given by an expert or consultant. Effective inservice includes introductory training as well as a plan for ongoing monitoring, enhancement, and follow-up of learning. Research corroborates the need for follow-up that continues long enough for new behaviors learned during introductory training to be incorporated into teachers' ongoing practice (Sparks and Loucks-Horsley, 1989). Planners can build this kind of reinforcement into professional development programs in a number of ways including providing opportunities to practice new methods in coaching situations, arranging for ongoing assistance and support, and systematically collecting feedback from teachers.

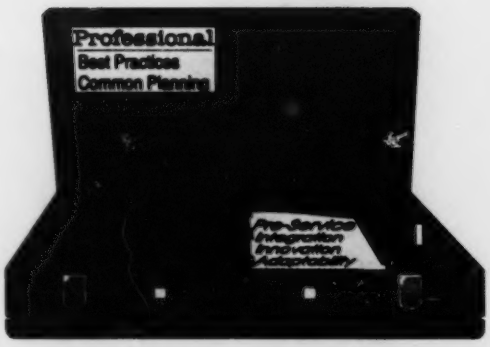
- **Is actively and continuously supported by administrators** — Numerous studies (McLaughlin & Marsh, 1978; Stallings and Mohlman, 1981; Loucks and Zacchie, 1983; Fielding and Schalock, 1985; Loucks-Horsley et al, 1987) reveal that active support by principals and district administrators is crucial to the success of any targeted improvement effort. The foundation of quality is respect and support. This supportive role begins with leadership that places a high priority on professional development, promotes communication, and fosters a spirit of collegiality. It extends to the thoughtful allocation of resources including time, follow-up on student performance, and evaluation of the implementation of targeted change.

Up-to-date materials, classroom equipment, time to pursue professional development, and time to practice and implement new teaching strategies are essential to ongoing staff improvement efforts. Focus on a holistic, integrated, principle-centered approach for solving personal and professional problems is embodied in the philosophy Steven Covey shares in *The Seven Habits of Highly Effective People* and people centered leadership.

The Commitment to Lifelong Learning

Quality, high performing, and effective educators do not rely solely on inservice programs provided by their schools or districts. They take personal responsibility for planning

for and pursuing other development activities including frequent returns to industry for updating skills and maintaining skill certificates and credentials through continuing education.



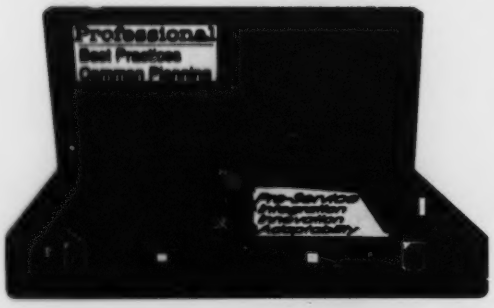
As self-directed learners, quality educators strive to gain new insights, improve their skills, and broaden their perspectives. They form alliances with supervisors, professional development specialists, principals, and other educators across all grade levels. They recognize talents of peers and learn from them. They participate in quality workshops and courses. They take advantage of courses offered through technologies such as on-line learning, interactive video conferences, satellite teleconferences, and other innovative approaches to enhance their own education. Quality educators access information and communicate via electronic mediums, E-mail, and the Internet. They also engage in experiential learning opportunities such as advanced technical training, industry updates, job shadowing, or other practical, real-world experiences in the community, and programs like Teacher Quest, Educators in Industry, or Business Education Exchanges.

A particularly useful tool for professional development can be membership in professional organizations. In addition to providing invaluable opportunities for idea sharing and networking with other teachers, many professional organizations also publish journals that feature the latest developments in the field, assess new strategies and methodologies, and highlight new career and training opportunities.

Attributes of the Professional Educator

The goal underlying any Florida professional development inservice program is to prepare educators in the competencies needed to improve students' success in postsecondary education and the workplace. Shortly after the creation of Florida's System of School Improvement and Accountability, the Education Standards Commission began a project to

identify and validate those teachers' competencies necessary to accelerate this initiative.



The Commission's efforts focused on preparing teachers to be proficient in helping students achieve higher and more rigorous standards (Goal 3). The Commission identified twelve broad principles and key indicators that reflect the high performance standards required of Florida's teachers. These *Accomplished Practices* are summarized below.

The professional educator . . .

- Uses teaching and learning strategies that reflect each student's culture, learning styles, special needs, and socioeconomic background (*Diversity*);
- Uses assessment strategies (traditional and alternative) to assist the continuous development of the learner (*Assessment*);
- Plans, implements, and evaluates effective instruction in a variety of learning environments (*Planning*);
- Uses an understanding of learning and human development to provide a positive learning environment that supports the intellectual, personal, and social development of all students (*Human Development and Learning*);
- Creates and maintains positive learning environments in which students are actively engaged in learning, social interaction, cooperative learning, and self-motivation (*Learning Environments*);
- Uses effective communication techniques with students and all other stakeholders (*Communications*);
- Uses appropriate techniques and strategies that promote and enhance the critical, creative, and evaluative thinking capabilities of students (*Critical Thinking*);
- Uses appropriate technology in teaching and learning processes (*Technology*);
- Works with various education professionals, parents, and other stakeholders in the continuous improvement of the educational experiences of students (*Role of the Teacher*);

- Engages in continuous professional quality improvement for self and school *(Continuous Improvement)*;

- Demonstrates knowledge and understanding of the subject matter (*Knowledge and Understanding*); and

- Adheres to the Code of Ethics and Principles of Professional Conduct of the Education Profession in Florida (*Ethics and Principles)*.

Key Chapter Points

- Florida's school improvement initiative calls on schools to assume greater responsibility for professional development programs.

- Quality is expected of all teachers. Quality and continuous improvement of educators requires recognition of the student *as the customer*.

- If educators are to successfully prepare students for the future, they must be prepared themselves.

- Preservice education should provide education graduates with a broad base of knowledge and skills to facilitate student learning, to work cooperatively, and to be responsive to student and community needs, interests, and concerns.

- Professional development of educators should continue in an environment that supports and sustains teachers as individuals and collaborators in the process of systemic reform.

- Professional development should be adapted to the individual's and organization's needs.

- Professional development programs should be designed to encourage every member of the learning community—teachers, support staff, administrators—in their pursuit of lifelong learning.

- The role of professional development is to assist educators in developing the accomplished practices targeted at improving student performance and successfully implementing Florida's education reform initiative.

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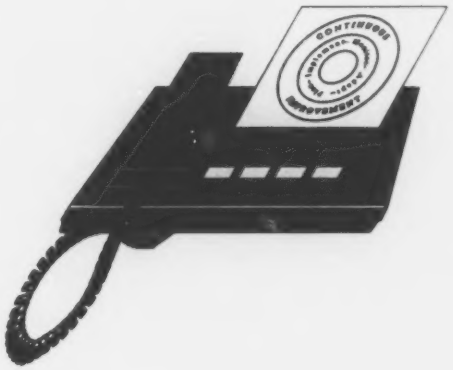


Chapter 9: Applied Technology Program Improvement

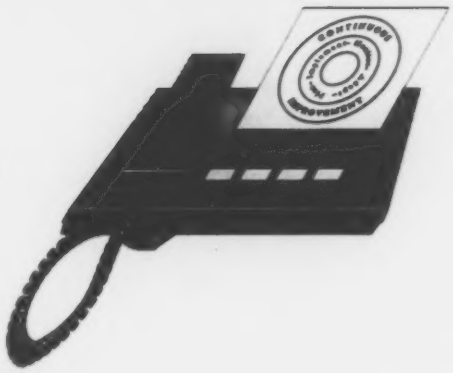
Chapter Highlights

- **The Nature of School Improvement**
- **The Evaluation Process**
- **Planning Changes for Improvement**
- **The Implementation Process**
- **Taking the Next Step**

Students in the fictitious community of Emerald Beach study math, reading, and writing from kindergarten through twelfth grade. However, the School Improvement Team at Emerald Beach High School has learned that local businesses find many graduates do not have adequate math, reading, writing, and workplace skills to succeed in the work force. Emerald Beach High School's Advisory Council recommends that a school improvement team be established to review the curriculum and methods of instruction in light of the needs of the business community. The membership of the team is comprehensive. The team includes representatives from the business community, teachers from academic disciplines and areas of applied technology, personnel from middle and elementary schools, parents, representatives from the local technical center, community college, and university as well as district-level personnel. Teachers on the team include representatives from math, language arts, social studies, business technology, health sciences, and other applied technology programs.

The Nature of School Improvement

The primary goal of Florida's improvement and accountability legislation is to raise student achievement by returning education decisions to the people closest to the students. This vision of local control becomes a reality when each school and district accepts the responsibility of becoming well informed about the school improvement process, whether school wide or targeted at a specific problem.



In Florida, School Advisory Councils lead the school improvement process by drafting annual school improvement plans for their school to raise student achievement to meet state education goals and standards. These councils are composed of educators, parents, and community members who represent the interest of all members of the school population.

The improvement process includes the following components: evaluating the results of the existing program in terms of student achievement, identifying areas of concern or areas that need improvement; determining the desired reforms to be undertaken; and implementing and evaluating these reforms.

The school improvement process, can be applied to subject area programs as well. This chapter highlights the improvement process and offers guidelines to local educators as they improve their academic and applied technology programs.

The Evaluation Process

> *Members of the integrated math, language arts, science, social studies and applied technology improvement team meet to discuss the ways local businesses can help Emerald Beach students achieve the skills required for success in the local work force. As the committee members study the various academic and applied technology curricula at different grade levels, teaching methods, and results of student assessments, they discover that Emerald Beach students have not been given the opportunity to apply their skills to authentic business, industry, or community related experiences. They find little integration of subject areas or communication between academic and applied technology teaching. As a result, students are not aware of the practical use of the skills they learn in the classroom or connections between subjects. The advisory committee considers various ways in which businesses can form partnerships with schools and teams of academic and applied technology teachers so that students can gain exposure to the business and industry world and see for themselves how they will use what they learn. They also initiate business field days and shadowing opportunities for teachers to obtain first hand experiences in various enterprises in the community.*

Regular program evaluation ensures that academic and applied technology programs raise the achievement of all students, identify and meet the needs of the local community, and focus on content that aligns with state standards. Program evaluation should include all people involved

in and affected by the program. To industry specific facilitate this, districts and schools can create applied technology program advisory committees, which might be part of a broader group including the principal, teachers from a variety of subject areas, district program supervisors, university faculty, students, parents, business representatives, and community citizens.

With the primary goal of student achievement as a backdrop, one of the academic and applied technology integrated improvement team's first tasks will be to develop a list of questions or concerns about their individual and integrated programs. Why are Emerald Beach's students having a difficult time in the world of work? The answer to this question can come from a variety of sources, including:

- Surveys, questionnaires, and interviews;
- School statistics (for example, enrollment in specific subjects and electives);
- Student assessments;
- Reports from external evaluators; and
- Self-evaluations.

Once information has been collected, the team should examine it and make recommendations for related program improvement. Specific evaluation methods used for applied technology programs were described in chapter 6. Labor, industry, and work place partners, including outside program reviewers require the following type of documentation:

- Workplace Skill Standards;
- Consensus Measures;
- Florida Employment Training Placement Improvement Program (FETPIP);
- School Improvement Program (SIP) Teams;
- Employer Surveys; and
- Program Improvement Plans.

Districts and schools are encouraged to promote and integrate innovative ideas suggested by those people specifically affected by and involved in the improvements.

Planning Changes for Improvement

The academic and applied technology advisory committee polls local businesses to determine how the school and the community can work together to improve student performance in academic and applied technology skills. Many local businesses demonstrate an interest in becoming involved with each of the disciplines in the classrooms through mentoring, job-shadowing programs, and classroom presentations. The managing editor of the local newspaper suggests beginning an internship program for high school students interested in publishing and advertising. The manager of a local insurance agency and an accounting group suggests beginning an internship program for high school students interested in the application of mathematics in the business world. Several industrial company leaders agree to assist teachers in setting up authentic activities related to their fields and offer to provide feedback to students during the assessment process. A teacher on the integrated improvement team suggests pairing interested business men and women with students for job-shadowing, tutoring, and mentoring activities. Another member suggests that the job shadowing include teachers. The integrated improvement team writes a comprehensive improvement plan incorporating all of these ideas. They include information on available resources and schedules for implementation.

Once areas needing improvement have been identified, the academic and applied technology improvement team can investigate various solutions and then develop a plan to implement the changes. A clear vision of what the school or teaching/learning situation will be when the improvements are in place is vital. The plan should identify the general elements that will be needed to implement improvements, when each might occur, who will be responsible for what, and what resources are needed. The plan should include a time line and a division of responsibilities to help ensure its completion. It should be flexible and include continuous internal monitoring to determine the effectiveness of the changes to be implemented.

It is important to keep in mind that all the additional resources needed may not be readily available. It may take some reallocation, some creative acquisition, or some modification of existing resources to get the job done. An important part of the plan is monitoring the results of any changes. Reevaluation and revisions may be necessary. When developing the improvement plan, the following questions should be considered:

- Are all the stakeholders involved in the process?
- Is there a consensus about what needs improvement as well as potential strategies to be undertaken?
- Have periodic checks been established to monitor implementation?
- Has a reasonable timeline been set?
- Have measures of adequate progress been clearly defined?
- Are the necessary human and financial resources available to implement the plan?
- Are the data collected appropriate to the questions being raised?
- Are the data organized so that they are easy to interpret (graphs, tables, charts)?

An important component of the improvement process is gaining the support and endorsement of those administrators who have overall responsibility for supporting and facilitating the necessary changes. Staff development, different forms of evaluation, and/or different ways of operating in school buildings and classrooms may be required.

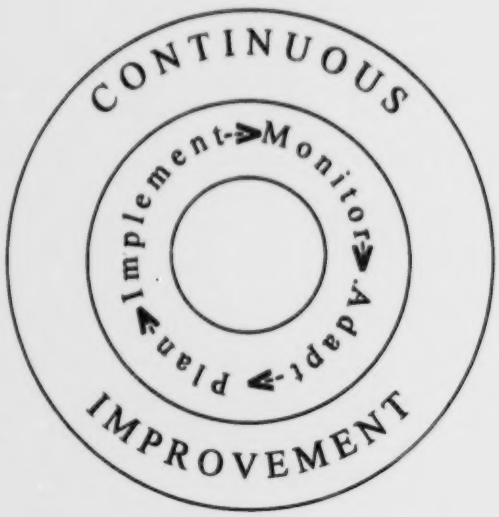
Once finalized, the improvement plan may be shared with parents and guardians, elected officials, business and industry leaders, and members of media organizations. By communicating planned program improvements to the public, schools and districts encourage the involvement of all educational stakeholders in the processes and operations of education, which in turn fosters the development of a greater sense of community.

The Implementation Process — VISION becomes reality!

> *Several mentoring, training, internship, and apprenticeship programs are in place with various companies, giving students the opportunity to participate in the daily operations of business. Students in an elementary class work with representatives from a local advertising agency to create, write, and videotape commercials for upcoming classroom elections. Representatives from the Chamber of Commerce visit middle schools and give workshops on small business practices. They assist students in writing service contracts for such jobs as baby sitting, lawn care, and other neighborhood chores. They also provide workshops on interviewing for jobs, completing applications, and other work forms. A high school class practices writing business proposals as a classroom activity in conjunction with a local sports franchise. A technical school automotive technology program sets up a real enterprise in the automotive facility that allows students to enter and progress through all technical skill areas as*

well as the planning, management, and other key aspects of the industry. The community college has a job fair in which major American and foreign auto makers interview technical school and associate degree graduating students for a variety of positions in their firms for both U.S. and foreign sites. Through the improvements planned by the advisory committee and implemented by local educators, the Emerald Beach community witnesses its vision for its integrated academic and applied technology programs.

Implementation is the stage when the vision for improvement becomes a reality. After the integrated improvement team has its improvement plan approved, it should begin to orchestrate and coordinate activities, strategies, and tactics at the school level. Implementation gives teachers and administrators opportunities to put into practice what they have learned during the improvement process and to work toward achieving the goals set forth in the integrated programs vision statement.



Program improvement necessitates changes which progress through several stages. People may initially oppose a change until they get enough information about it to become comfortable with it. With time, the innovation may even be improved by the very people who were opposed to its initial implementation.

Taking the Next Step — Evaluation Cycle

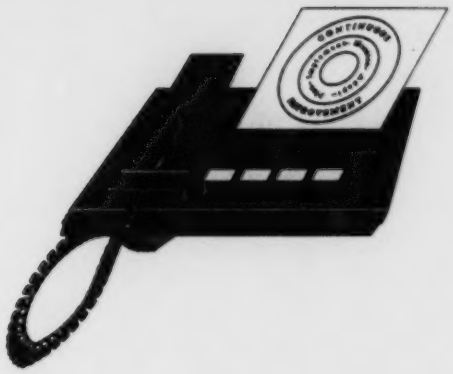
The community of Emerald Beach is proud of its schools. Students, teachers, parents, and businesses have worked together to improve math, reading, and writing. Performance has improved on a variety of authentic measures in classrooms and standardized test scores have improved. Communications and math scores continue to be strong in the statewide assessments: Florida Writes, Grades 4, 8, and 10; and High School Competency Test (HSCT), Grade 11. Improvements in career placement of applied technology students, employer responses and programs evaluations have improved. The local community college has reported higher academic skills of current graduates and decreased needs for remediation of students who have completed the integrated curriculum. Through the partnerships developed between schools and businesses, students have demonstrated their understanding of the importance and the applicability of integrated academic and applied technology skills to the business environment. Local businesses have noticed an improvement in the skills of the students who choose to work in the community after high school, technical skills training, or community college graduation.

The community improves as the schools improve. As the community changes, so does the district's and community college's Pre-K through 14 academic and applied technology programs. The process is cyclical, continuous, and mutually beneficial.

The cyclical process of evaluation, planning for improvement, implementing changes for improvement, and monitoring the results of those changes has a number of benefits:

- Involves a broad representation of the local community;
- Allows for continual improvement that incorporates advances in technology and increases in knowledge within various disciplines;
- Provides the opportunity to meet the unique needs of students by creating programs with real world applications, addressing specific local issues and concerns; and
- Aligning curriculum and assessment with state standards.

Ultimately, an ongoing improvement process helps ensure success for each and every Florida student in meeting high academic standards and in learning work place skills.



Key Chapter Points

- In both business and industry and in public sector organizations, a collaborative process of sound and systematic program evaluation, planning for improvement, implementation of innovative strategies, and monitoring of effects leads to success
- The improvement process implemented through the school advisory council can be applied to integrated math, language arts, and applied technology programs.
- Change happens slowly and only in an environment that encourages innovative and proactive thinking.
- To be systemic and successful, school and district programs should be designed with care, include all those concerned about educational success especially front line practitioners, and provide time for creativity, implementation, practice, reflection, revision, and renewal.

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Appendix 1A

Florida Applied Technology's Vision, Mission, and Aim Statements	
◆ **Vision:**	**All Floridians will possess the knowledge, skills, attitudes, and abilities necessary to achieve continuous self-sufficiency.**
◆ **Mission:**	***Florida will develop standards and benchmarks, allocate resources, provide technical assistance, and assess performance for education and training providers based on high levels of student achievement, a safe learning environment and the continuous self-sufficiency of all Floridans.***
◆ **Aims:**	➙ **School-to-Work**--Florida's initiative will provide all students pre-K through adult a coordinated system of programs facilitating the school to career continuum. ➙ **High-Wage/High-Skill-Education** and training programs will be aligned with the Occupational Forecasting Conference to provide business and industry with a ready workforce and to assure the continuous, self-sufficiency of Florida's workforce. ➙ **One-Stop Career Centers**--All Floridians will have access to an integrated database that will contain complete information about educational and occupational opportunities statewide and all subsequent support services necessary for any Floridian to attain and maintain self-sufficiency. ➙ **Welfare-to-Work**--Welfare recipients will have access to education and training systems leading to self sufficiency within the requirements of welfare-to-work legislation. ➙ **Literacy**--All Florida citizens will have access to literacy education and training services through school, work, social services and/or career centers which will enable them to become self sufficient, critical readers and productive workers. ➙ **Family issues** -All students will have the opportunity to acquire knowledge and skills to strengthen families and empower individuals to take action for the well-being of themselves and families in the home, workplace and communities.

APPENDIX 2A

Florida's School Improvement and Accountability Act Goal 3 Connections Between Student/Teacher Roles and Standard Outcomes

The matrix with roles identified for each of the eleven standards in Goal 3 is designed to show in a graphic manner levels at which students should be able to demonstrate specific outcomes related to each standard. The standards and roles which require students to demonstrate information management, effective communication, numeric problem solving, and creative and critical thinking will be assessed and documented through methods prescribed by Florida's Department of Education and legislation. The remaining roles, including responsible and ethical work resource management, systems management, cooperation and teamwork, effective leadership, multicultural sensitivity, and parental involvement will be assessed through strategically planned district assessments and documentation.

The matrix is designed to assist teachers, parents, business and community partners, and students to see "at a glance" specific standards all students should demonstrate at the various levels within their educational experiences.

As the student improves and develops through educational experiences, the sophistication and complexity of learning demonstrated should increase accordingly.

Appendix 2A: Florida's School Improvement and Accountability Act Goal 3 Connections Between Student/Teacher Roles and Standard Outcomes

Standard 1: Information Manager

Outcomes	Level 1 Pre-K - 2	Level 2 Grades 3-5	Level 3 Middle School 6-8	Level 4 High School 9-12	Level 5 Post-secondary 13+
Locate and collect relevant information from a variety of level-appropriate sources	■	■	■	■	■
Interpret and explain concepts and ideas in information		■	■	■	■
Apply information in level-appropriate tasks		■	■	■	■
Evaluate information with respect to usefulness, accuracy, relevance, and plausibility		■	■	■	■
Store and maintain information using level-appropriate systems		■	■	■	■

Standard 2: Effective Communicator

Outcomes	Level 1 Pre-K - 2	Level 2 Grades 3-5	Level 3 Middle School 6-8	Level 4 High School 9-12	Level 5 Post-secondary 13+
Accurately records and communicates information through a variety of media	■	■	■	■	■
Creates and communicates using appropriate media	■	■	■	■	■
Accurately uses language, graphic representations, styles, organizations and format appropriate to the language	■	■	■	■	■
Communicates through a variety of media	■	■	■	■	■
Uses appropriate form by checking, editing, and revising		■	■	■	■

Standard 3: Numeric Problem Solvers

Outcomes	Level 1 Pre-K - 2	Level 2 Grades 3-5	Level 3 Middle School 6-8	Level 4 High School 9-12	Level 5 Post-secondary 13+
Identifies and performs appropriate numeric procedures in solving problems	■	■	■	■	■
Estimates approximate numeric solutions to problems without use of calculating devices	■	■	■	■	■
Accurately analyzes, synthesizes, and evaluates numeric ideas, concepts, and information		■	■	■	■

Standard 4: Creative and Critical Thinkers

Outcomes	Level 1 Pre-K - 2	Level 2 Grades 3-5	Level 3 Middle School 6-8	Level 4 High School 9-12	Level 5 Post-secondary 13+
Uses rules or principles to make connections between two or more seemingly unrelated ideas.		■	■	■	■
Evaluates and chooses best approaches to accomplish goals	■	■	■	■	■
Identifies problem, analyzes and evaluates possible solutions, and implements best solution	■	■	■	■	■
Develops learning techniques that allows for new knowledge and skills to be applied in different ways	■	■	■	■	■

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Standard 5: Responsible and Ethical Workers

Outcomes	Level 1 Pre-K - 2	Level 2 Grades 3-5	Level 3 Middle School 6-8	Level 4 High School 9-12	Level 5 Post-secondary 13+
Exerts a high level of effort and perseverance towards goal attainment	■	■	■	■	■
Diligently pursues the highest standards in work, attendance, punctuality, while maintaining a positive and flexible attitude	■	■	■	■	■
Demonstrates a realistic and positive view of themselves as unique individuals	■	■	■	■	■
Demonstrates friendliness, assertiveness, leadership, adaptability, empathy, and politeness in any situation	■	■	■	■	■
Exhibits interest in what others say and do	■	■	■	■	■
Deals with persons and situations with integrity , reliability, and honesty	■	■	■	■	■
Exhibits civic, personal, and social responsibility	■	■	■	■	■
Demonstrates behaviors that support physical wellness and personal well being	■	■	■	■	■
Assumes a positive role in the family, work place, and community	■	■	■	■	■

Standard 6: Resource Managers

Outcomes	Level 1 Pre-K - 2	Level 2 Grades 3-5	Level 3 Middle School 6-8	Level 4 High School 9-12	Level 5 Post-secondary 13+
Develops appropriate time lines in order to accomplish a goal	■	■	■	■	■
Able to develop, monitor, and adjust budgets as needed to accomplish a goal			■	■	■
Identifies and acquires the materials and supplies needed to complete an activity and determines the best "just-in-time" distribution or storage of those items			■	■	■
Identifies personnel with the appropriate skills, knowledge, and values necessary to complete an activity, and provides meaningful feedback during and on task completion to those involved			■	■	■

Standard 7: Systems Manager

Outcomes	Level 1 Pre-K - 2	Level 2 Grades 3-5	Level 3 Middle School 6-8	Level 4 High School 9-12	Level 5 Post-secondary 13+
Identifies, selects, evaluates, and obtains the appropriate information needed for a given task	■	■	■	■	■
Develops, organizes, processes, and maintains files (paper or electronic) in a logical "user friendly" format			■	■	■
Analyzes trends and performance of systems and predicts the impact these trends will have on goal attainment				■	■
Makes suggestions to modify existing systems in order to enhance goal attainment		■	■	■	■
Selects, installs, and monitors procedures or technology that will best facilitate goal attainment	■	■	■	■	■
Generates workable solutions to technological problems and identifies resources for more complex problems				■	■

Standard 8: Cooperative Workers

Outcomes	Level 1 Pre-K - 2	Level 2 Grades 3-5	Level 3 Middle School 6-8	Level 4 High School 9-12	Level 5 Post-secondary 13+
Contributes ideas and makes suggestions to group effort to solve a problem or complete a task	■	■	■	■	■
Takes responsibility and completes share of tasks assigned to group, resolves differences within group, utilizes the strengths of individual group members	■	■	■	■	■
Teaches other the knowledge and skills needed to complete a task	■	■	■	■	■

Standard 9: Effective Leaders

Outcomes	Level 1 Pre-K - 2	Level 2 Grades 3-5	Level 3 Middle School 6-8	Level 4 High School 9-12	Level 5 Post-secondary 13+
Communicates thoughts, ideas, and values to influence others toward goal attainment	■	■	■	■	■
Logically defends position while giving full consideration to others viewpoints	■	■	■	■	■
Resolves disputes with others in order to attain goal	■	■	■	■	■

Standard 10: Multiculturally Sensitive Citizens

Outcomes	Level 1 Pre-K - 2	Level 2 Grades 3-5	Level 3 Middle School 6-8	Level 4 High School 9-12	Level 5 Post-secondary 13+
Demonstrates appreciation of their own culture and the cultures of others	■	■	■	■	■
Cooperates with persons of different gender, ethnic, religious, or socioeconomic backgrounds to accomplish tasks	■	■	■	■	■
Recognizes bias and stereotyping in everyday life situations	■	■	■	■	■

Outcomes	Level 1 Pre-K - 2	Level 2 Grades 3-5	Level 3 Middle School 6-8	Level 4 High School 9-12	Level 5 Post-secondary 13+
School administrators and staff will welcome parents as full partners in helping students improve performance by making available time and opportunities for mutual communication on curriculum, assessment, and goals for individual students.	■	■	■	■	■
Parents will support improved student performance by: * communicating with school personnel regarding curriculum assessment and goals for individual students; * providing a home environment which is supportive of improving student performance; and * providing encouragement and discipline as appropriate to support school success.	■	■	■	■	■

APPENDIX 3-A

Applied Technology's "All Aspects of the Industry" Developmental Framework

The framework for applied technology is presented in a horizontal matrix showing the five developmental levels within the education system which:

The curriculum is designed with the following in mind:

Strand = most general type of information and is used to breakdown each subject area into categories of knowledge.
Standard = general statement of expected learner achievement within each strand.
Benchmark = learner expectation for each standard at each developmental grade level, [Pre-K-2, 3-5, 6-8, 9-12, 13,14-Adult]
Sample Performance Description = examples of things students could do to demonstrate achievement of the benchmark.

Appendix 3B - Provides sample performance descriptions for each benchmark identified in the applied technology developmental framework.

Appendix 3A

Strand 1.0 Planning

Standard 1.1 Applies planning methods to decision-making related to life and work roles.

Primary (Pre-K to 2)	Intermediate (3-5)	Middle School (6-8)	High School (9-12)	Post Secondary (13, 14 & Adult)
1.1.1.1 Follows sequence of directions.	1.1.2.1 Demonstrates knowledge of a planning process. 1.1.2.2 Demonstrates ability to plan ahead for different types of events.	1.1.3.1 Demonstrates the steps involved in planning and organizing an event or activity. 1.1.3.2 Creates a written plan for different types of products, projects, or events using appropriate planning methods. 1.1.3.3 Demonstrates ability to research, conduct and evaluate a long term project or experiment.	1.1.4.1 Demonstrates ability to gather information from various sources to plan a project. 1.1.4.2 Creates a collaborative and comprehensive plan which addresses specific events, products, or projects either personally or for the work place. 1.1.4.3 Demonstrates knowledge of planning processes in an industry.	1.1.5.1 Demonstrates organization and planning processes used in the industry. a. Researches and analyzes needs, customer concerns, problems, to be addressed. b. Uses activities, time lines, responsibilities, in planning for projects and goal setting. c. Develops and implements the plan based on a needs assessment. d. Creates and implements measurement to determine continuance, adjustment or termination. e. Allocates resources for implementation of the plan. f. Evaluates the planning process and the plan implementation.

Strand 2.0 Management

Standard 2.1 Employs management techniques to manage projects and enterprises related to work and life roles.

Primary (Pre-K to 2)	Intermediate (3-5)	Middle School (6-8)	High School (9-12)	Post Secondary (13, 14 & Adult)
2.1.1.1 Selects a project to complete. 2.1.1.2 Demonstrates ability to complete and document progressive tasks. 2.1.1.3 Demonstrates ability to work cooperatively and productively in pairs and teams.	2.1.2.1 Demonstrates ability to work in cooperative groups/teams taking turns at managing and making decisions. 2.1.2.2 Demonstrates ability to integrate planning and time management in the process of decision making within their teams. 2.1.2.3 Demonstrates ability to reflect on decisions and analytically report them.	2.1.3.1 Recognizes the need to work in a diverse collaborative group to design, fabricate, distribute, and dispose/recycle products or services. 2.1.3.2 Analyzes management systems for a project or enterprise, both personally and in the work place. 2.1.3.3 Applies current management systems to school based projects or enterprises.	2.1.4.1 Develops the planning, implementation, fiscal, and evaluation systems necessary to manage a project or provide a service. 2.1.4.2 Analyzes the managerial skills necessary for decision making in different work related situations.	2.1.5.1 Researches, analyzes, and selects the most appropriate management systems for a specific situation. 2.1.5.2 Develops an appropriate management plan. 2.1.5.3 Demonstrates industry specific decision making and critical thinking skills. 2.1.5.4 Applies resource management techniques in planning and implementing processes. 2.1.5.5 Applies problem solving process to industry related management issues or projects.

Strand 2.0 Management

Standard 2.2 Applies marketing and promotional techniques to products and services in a business or social setting.

Primary (Pre-K to 2)	Intermediate (3-5)	Middle School (6-8)	High School (9-12)	Post Secondary (13, 14 & Adult)
2.2.1.1 Describes ways media conveys messages in the school and community.	2.2.2.1 Develops elementary media productions for school use.	2.2.3.1 Creates simple product or service and develops testing, production, distribution, marketing, and disposal systems.	2.2.4.1 Analyzes concepts of supply & demand and how these apply to promotion in a specific industry. 2.2.4.2 Analyzes concepts of diminishing returns and how they apply to marketing and promotion of a specific industry. 2.2.4.3 Analyzes various marketing systems and the methods used within each (including media, i.e. mail/catalog sales, retail and sales of services vs. products). 2.2.4.4 Develops a promotional campaign for a target market using technology appropriate for industry, the community, or school.	2.2.5.1 Develops a complete marketing system, including: a. Develops promotional campaign for a specific business or industry in a collaborative manner. b. Designs a distribution system for products or services. c. Analyzes and uses market research procedures. d. Establishes strategic goals. e. Develops a feedback system via customer responses, questionnaires, and surveys. f. Develops a plan that is enticing to the diverse population, without being inflammatory to any other group. g. Projects and monitors market share. 2.2.5.6 Demonstrates leadership ability in implementing the plan.

Strand 2.0 Management

Standard 2.3 Demonstrates knowledge and abilities necessary as a contract employee or to initiate and maintain a service or product based business.

Primary (Pre-K to 2)	Intermediate (3-5)	Middle School (6-8)	High School (9-12)	Post Secondary (13, 14 & Adult)
2.3.1.1 Describes different products and services available in the local community. 2.3.1.2 Demonstrates an understanding of the concept of business ownership.	2.3.2.1 Demonstrates understanding that there are different types of business ownership.	2.3.3.1 Researches and creates a model for a student owned business.	2.3.4.1 Analyzes the positive and negative aspects of different types of business ownership. 2.3.4.2 Demonstrates a basic understanding of various resources and skills required to initiate and maintain a business.	2.3.5.1 Develops a comprehensive plan to initiate and maintain a specific business, including: a. Analyze the amount of capital needed and the various sources for that capital. b. Determine location and type of facilities required. c. Analyze choices of buy, build, or lease. d. Researches all licenses, certificates, insurance, and approvals needed for the business. e. Develops appropriate systems for setting prices, inventory control, invoicing procedures, initial and long term marketing plan, cash flow, accounting procedures, and reports.

Strand 3.0 Finance

Standard 3.1 Demonstrates financial planning ability and decision-making related to work and life roles.

Primary (Pre-K to 2)	Intermediate (3-5)	Middle School (6-8)	High School (9-12)	Post Secondary (13, 14 & Adult)
3.1.1.1 Demonstrates ability to select an item based on need/purpose, money available, and alternative choices (i.e. snacks).	3.1.2.1 Develops a financial plan for an event (field trip, class party, family vacation, or other functions). 3.1.2.2 Relates accounting for a school or personal function (such as a club), to the budget process for school or business.	3.1.3.1 Develops a budget and makes decisions required for achieving a balanced project budget. 3.1.3.2 Develops a financial plan for both work and personal goals. 3.1.3.3 Creates written accounts for budgets and rationale for financial decisions.	3.1.4.1 Develops a budget, financial plan, and cash flow projections for a team project. 3.1.4.2 Reconciles income and expense accounts in a work place situation to determine profit/loss. 3.1.4.3 Completes simple tax forms required of employees. 3.1.4.4 Evaluates various retirement programs and investment options (such as IRAs, 401K plans, etc.). 3.1.4.5 Evaluates personal insurance needs (such as health, life, disability, liability, etc).	3.1.5.1 Develops a financial plan including cash flow projections, tax considerations, interest rate effects, etc. 3.1.5.2 Develops and reconciles simple accounting for income and expenses to budget and make financial decisions. 3.1.5.3 Analyzes and researches sources, cost, and availability for start-up capital. 3.1.5.4 Analyzes and prepares local, state, and federal forms necessary to enter business in a new or established industry. 3.1.5.5 Analyzes methods of protecting, extending, or leveraging personal net worth through insurance, tax-deferred options, real estate, and stock funds.

Strand 4.0 · Technical and Production Skills in the Work Place

Standard 4.1: Organizes work assignments by demonstrating production techniques.

Primary (Pre-K to 2)	Intermediate (3-5)	Middle School (6-8)	High School (9-12)	Post Secondary (13, 14 & Adult)
4.1.1.1 Organizes and completes collaborative product-based project or service for school or the community.	4.1.2.1 Applies a variety of organizational and procedural skills to assignments and projects in school or community.	4.1.3.1 Analyzes alternative production methods for production of products or services.	4.1.4.1 Analyzes and describes the various industry methods of organizing the workplace to enhance productivity.	4.1.5.1 Develops an industry specific production plan analyzing alternate types of production models utilizing technology and ranking anticipated productivity and costs.
4.1.1.2 Demonstrates an understanding of the concept of taking turns.	4.1.2.2 Performs all assigned tasks and/or roles in a cooperative group or unit (e.g. job rotation and cross training).	4.1.3.2 Synthesizes cost of production and distribution with return and profit.	4.1.4.2 Analyzes and describes the jobs required in an industry workplace.	4.1.5.2 Analyzes various production models including assembly line, job rotation, cross-trained workers, and production team.
4.1.1.3 Teaches peers how to complete a task.		4.1.3.3 Applies a variety of technical skills to simple projects.	4.1.4.3 Analyzes development of higher quality products or services using continuous quality improvement approach to industry related project.	4.1.5.3 Applies a variety of technical skills to complex, long term industry specific projects.
			4.1.4.4 Applies a variety of technical skills to industry specific projects.	

Strand 5: Technology

Standard 5.1 Integrates academic and applied technology principles into the workplace.

Primary (Pre-K to 2)	Intermediate (3-5)	Middle School (6-8)	High School (9-12)	Post Secondary (13, 14 & Adult)
5.1.1.1 Analyzes "best simple technology" to perform simple academic tasks (i.e., crayons, computers, etc.).	5.1.2.1 Creates a simple technology-based project applying math, science, social studies, and language arts skills.	5.1.3.1 Analyzes technologies available to assist with a problem's solution and uses academic skills to research, adopt, or develop and evaluate a "best solution."	5.1.4.1 Analyzes and displays examples of all academic disciplines related to industry.	5.1.5.1 Applies math and/or scientific concepts to industry related problems.
5.1.1.2 Uses technology to improve school related skills.		5.1.3.2 Develops solutions to workplace and life role problems that require higher level math, science, and technical communications skills.	5.1.4.2 Creates potential solutions to industry problems using math and/or scientific concepts and communicates solution using industry appropriate language arts and graphic skills.	5.1.5.2 Applies necessary language arts/communication skills for a specific industry.
		5.1.3.3 Uses applied technology and workplace examples in academic disciplines to solve problems.		5.1.5.3 Applies other academic skills (i.e. health, social sciences, arts) required for specific industry situation.

Strand 5: Technology

Standard 5.2 Applies appropriate technology to an industry to solve technical and production problems

Primary (Pre-K to 2)	Intermediate (3-5)	Middle School (6-8)	High School (9-12)	Post Secondary (13, 14 & Adult)
5.2.1.1 Uses technology in "just in time" learning settings (e.g., applies computer software to complete a class project).	5.2.2.1 Solves problems by using appropriate technology and "just in time" learning. (e.g. applies computer software to solve problems).	5.2.3.1 Applies problem solving skills to determine the level and suitability of various technologies needed to solve industry related problems.	5.2.4.1 Researches and analyzes the levels of technology applied in an industry. 5.2.4.2 Applies technology in problem solving activities, as they relate to production. 5.2.4.3 Demonstrates an understanding of industry specific automated and electronically controlled systems and processes. 5.2.4.4 Uses technologies to individually access information or tutorials as needed to complete a personal or industry related task, process, or project.	5.2.5.1 Uses technology to trouble shoot, record, or predict industry-related problems. 5.2.5.2 Analyzes the suitability of various technologies to improve productivity of service, provide a product, or produce industrials. 5.2.5.3 Routinely uses technologies learned "just in time" as required by new applications, code changes, and work requirements.

Strand 6: Labor

Standard 6.1 Demonstrates an understanding of labor issues related to the work place.

Primary (Pre-K to 2)	Intermediate (3-5)	Middle School (6-8)	High School (9-12)	Post Secondary (13, 14 & Adult)
6.1.1.1 Shares responsibility with others in small group work. 6.1.1.2 Demonstrates leadership abilities.	6.1.2.1 Completes assigned tasks in work related projects in a high quality and timely manner. 6.1.2.2 Works as a team member on projects. 6.1.2.3 Leads team members on project.	6.1.3.1 Demonstrates team work skills in projects. 6.1.3.2 Analyzes fair division of work in projects. 6.1.3.3 Evaluates self and peer performance on projects. 6.1.3.4 Directs others in group projects.	6.1.4.1 Analyzes social, legal, economic, and ethical aspects of labor and management relationship. 6.1.4.2 Assigns tasks, coordinates work, and motivates peers at school, work, and sports or other social settings.	6.1.5.1 Analyzes the interrelationship of employer/employee legal and ethical rights and responsibilities in the work place and community. 6.1.5.2 Analyzes effects of collective bargaining, employee benefits, wage structures, and employment contracts. 6.1.5.3 Demonstrates an understanding of legal aspects of employer/employee relationships, including: a. Recognizes issues relating to collective bargaining. b. Analyzes the terms and conditions of employment contracts. c. Analyzes labor law issues related to a specific industry.

Strand 7: Community Issues

Standard 7.1: Analyzes and communicates the impact that industry and the community have on each other and on the individual.

Primary (Pre-K to 2)	Intermediate (3-5)	Middle School (6-8)	High School (9-12)	Post Secondary (13, 14 & Adult)
7.1.1.1 Demonstrates awareness of the intra-dependence of local industries, the community, and the individual.	7.1.2.1 Analyzes the importance of industry and the community to each other.	7.1.3.1 Utilizes current social, economic, political, and/or environmental issues or data as a basis for analyzing the impact that the community and industry have on each other. 7.1.3.2 Participates in social and or environmental projects which impact the school and/or community.	7.1.4.1 Researches a given industry's data and reports its environmental, social, and economic impact on the community. 7.1.4.2 Demonstrates how community demographics (population, geography, and natural resources, etc.) impact industry. 7.1.4.3 Uses applied technology and workplace examples to solve academic problems.	7.1.5.1 Identifies, researches, analyzes, and projects the impact of an industry on the environment in a community. 7.1.5.2 Develops a public relations plan to communicate the positive impact of an industry. 7.1.5.3 Identifies, researches, and analyzes the community's impact on and involvement with a local industry. 7.1.5.4 Develops a community relations plan to increase community involvement with local industry.

Strand 8: Health, Safety, and Environment

Standard 8.1: Analyzes and communicates health and safety issues in the workplace.

Primary (Pre-K to 2)	Intermediate (3-5)	Middle School (6-8)	High School (9-12)	Post Secondary (13, 14 & Adult)
8.1.1.1 Demonstrates awareness of health related habits and activities, i.e., hand washing, eating, and drinking.	8.1.2.1 Demonstrates healthy habits in and out of school.	8.1.3.1 Demonstrates an understanding of health and safety issues in and out of the school.	8.1.4.1 Develops an evaluation or instrument that deals with health and safety in workers' professional life.	8.1.5.1 Researches, analyzes and complies with federal and state health and safety laws and regulations for an industry.
8.1.1.2 Demonstrates awareness of unhealthy habits and activities.	8.1.2.2 Demonstrates safety practices in and out of school.	8.1.3.2 Demonstrates an understanding of environmental problems that impact health and safety.	8.1.4.2 Researches environmental problems and reports their impact on the occupational health and safety of a specific industry.	8.1.5.2 Demonstrates best practices for health and safety in the workplace and community.
8.1.1.3 Demonstrates awareness of safety practices.	8.1.2.3 Identifies problems related to workplace, community, and environment.	8.1.3.3 Utilizes analysis and problem-solving skills to find solutions for environmental concerns affecting the school.	8.1.4.3 Analyzes federal and state safety laws and regulation (such as OSHA) as they relate to a specific industry.	8.1.5.3 Analyzes the environmental concerns of a specific industry.
8.1.1.4 Demonstrates awareness of safety hazards.	8.1.2.4 Knows where to get information or help in dealing with health and safety issues.	8.1.3.4 Identifies where and how to get information or help concerning health and safety issues.	8.1.4.4 Evaluates methods to resolve environmental problems.	8.1.5.4 Compares the environmental impact of light and heavy industry in a community, as it relates to health, safety and economic benefit.
8.1.1.5 Demonstrates awareness of dangerous items in school and at home.				8.1.5.5 Demonstrates ability to evaluate cost vs. benefit of environmental protection.
8.1.1.6 Demonstrates knowledge of how to get help for emergencies.				8.1.5.6 Projects, analyzes and implements a plan to solve an environmental dilemma in a community.

Strand 9: Personal Conduct

Standard 9.1: Demonstrates an understanding of professional conduct in personal roles, as well as in work and industry.

Primary (Pre-K to 2)	Intermediate (3-5)	Middle School (6-8)	High School (9-12)	Post Secondary (13, 14 & Adult)
9.1.1.1 Follows classroom rules for behavior. 9.1.1.2 Demonstrates positive interpersonal skills, teamwork, and a work ethic in class work.	9.1.2.1 Analyzes and conforms to classroom rules for individual and group work. 9.1.2.2 Demonstrates ability to work effectively and positively with diverse peers and adults displaying appropriate behavior. 9.1.2.3 Recognizes the importance and need for high standards of professional conduct in both personal and work roles.	9.1.3.1 Develops and conforms to group and individual conduct guidelines. 9.1.3.2 Demonstrates interpersonal skills which enhance team productivity and foster positive work attitudes.	9.1.4.1 Researches and analyzes a code of professional conduct for a specific industry. 9.1.4.2 Demonstrates the ability to cooperatively work in various settings, across diverse populations. 9.1.4.3 Facilitates the business/education partnership in the development of joint goals.	9.1.5.1 Exhibits a code of ethics in the workplace. 9.1.5.2 Utilizes self-management techniques in both work and life roles. 9.1.5.3 Demonstrates an understanding of responsibility in both work and life roles. 9.1.5.4 Displays integrity and honesty in all work and personal situations. 9.1.5.5 Creates a business and education partnership.

APPENDIX 3-B

Applied Technology Sample Performance Description Matrix

The matrix is designed to give teachers ideas of how students may demonstrate the applied technology core standards by level throughout the curriculum. The matrix also shows where the roles required in the School Improvement Accountability Act (SIAA) Goal 3 may be performed through real activities in the curriculum.

The matrix is organized by developmental level for each of the nine standards.

Primary	PreK-2
Intermediate	3-5
Middle School	6-8
High School	9-12
Post-Secondary and Adult	13+

Primary (Pre-K through 2)

IM - Information Managers
EC - Effective Communicators
PS- Numeric Problem Solvers
CT - Creative and Critical Thinkers
EW - Responsible and Ethical Workers
RM - Resource Managers
SM - Systems Managers
CW - Cooperative Workers
EL- Effective Leaders
MS - Multiculturally Sensitive Citizens
PI - Parental Involvement

Strand 1: Planning	**Standard 1.1: Applies planning methods to decision-making related to life and work roles.**										
Benchmark	**Sample Performance Description**	IM	EC	PS	CT	EW	RM	SM	CW	EL	MS	PI
1.1.1.1 Follows sequence of directions.	- Completes assigned classroom task after following directions. - Students plan the sequence of events for their day using plan, do, review, to manage their time. - Plan a birthday party . - Tell how to play a game.	✓	✓			✓			✓			
Strand 2: Management	**Standard 2.1: Employs management techniques to manage projects and enterprises related to work and life roles.**	IM	EC	PS	CT	EW	RM	SM	CW	EL	MS	PI
2.1.1.1 Selects a project to complete.	- Selects learning activity based on interest or developmental level. - Select model to build with legos or blocks, or developmentally appropriate materials. - Select a game to play.	✓	✓		✓		✓	✓				
2.1.1.2 Demonstrates ability to complete and document progressive tasks.	- Demonstrates use and care of technology including computer, books, and materials. - Identifies, names, and matches shapes and colors to pre-existing educational materials. - Identify by sight and word foods or other related groups of things.	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
2.1.1.3 Demonstrates ability to work cooperatively and productively in pairs and triads.	- Demonstrates ability to perform on a team. - Completes assigned task with a partner(s).	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓

Primary (Pre-K through 2)

IM - Information Managers
EC - Effective Communicators
PS- Numeric Problem Solvers
CT - Creative and Critical Thinkers
EW - Responsible and Ethical Workers
RM - Resource Managers
SM - Systems Managers
CW - Cooperative Workers
EL- Effective Leaders
MS - Multiculturally Sensitive Citizens
PI - Parental Involvement

Strand 2: Management	**Standard 2.2: Applies marketing and promotional techniques to products and services in a business or social setting.**										
Benchmark	**Sample Performance Description**	IM	EC	PS	CT	EW	RM	SM	CW	EL	MS	PI
2.2.1.1 Describes ways media conveys messages in the school and community.	- Uses pictures to tell a story. - Identifies directional signs in buildings. - Attends and responds to school announcements. - Discusses television commercials geared to children. - Repeats commercials. - Decides what to include in school news about their day.	✓	✓	✓			✓	✓		✓	✓	✓
Strand 2: Management	**Standard 2.3: Demonstrates knowledge and abilities necessary as a contract employee or to initiate and maintain a service or product based business.**	IM	EC	PS	CT	EW	RM	SM	CW	EL	MS	PI
2.3.1.1 Describes different products and services available in the local community.	- Identifies what companies and jobs are in the community. - Describes what jobs are in the school. - Describes where different people work. - Describes where products such as food, clothing, or shelter are produced or sold.	✓	✓		✓	✓	✓		✓	✓	✓	✓
2.3.1.2 Demonstrates an understanding of the concept of business ownership.	- Participates in a classroom business project such as a cookie sale, coupon books, candies.	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓

Primary (Pre-K through 2)

IM - Information Managers
EC - Effective Communicators
PS- Numeric Problem Solvers
CT - Creative and Critical Thinkers
EW - Responsible and Ethical Workers
RM - Resource Managers
SM - Systems Managers
CW - Cooperative Workers
EL- Effective Leaders
MS - Multiculturally Sensitive Citizens
PI - Parental Involvement

Strand 3: Finance	Standard 3.1 Demonstrates financial planning ability and decision-making related to work and life roles.										
Benchmark	**Sample Performance Description**	IM	EC	PS	CT	EW	RM	SM	C W	EL	MS	PI
3.1.1.1 Demonstrates ability to select an item based on need/purpose, money available, and alternative choices, (i.e. snacks).	- Identify coins and value of U.S. money. - Plan a project and acquire resources to complete tasks. - Select a snack to purchase based on available money.	✓	✓	✓		✓	✓	✓				✓
Strand 4: Technical and Production Skills in the Work Place	**Standard 4.1 Organizes work assignments by demonstrating production techniques.**	IM	EC	PS	CT	EW	RM	SM	CW	EL	MS	PI
4.1.1.1 Organizes and completes collaborative product-based project or service for school or the community.	- Participates in cleanup projects in class or school. - Participates in recycling in class, school, or home. - Participates in a holiday activity such as Arbor Day planting tree seedlings. - Participates in Newspaper collections to raise funds for class.	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
4.1.1.2 Demonstrates an understanding of the concept of taking turns.	- Works well with others. - Understands rotation. - Waits for recognition or turn. - Participates in circle time. - Participates appropriately in rotation takes appropriate turn in line.	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
4.1.1.3 Teaches peers how to complete a task.	- Shares expertise with partner. - Shows "how to" task they know with others.	✓	✓		✓	✓	✓	✓	✓	✓	✓	✓

Primary (Pre-K through 2)

IM - Information Managers SM - Systems Managers
EC - Effective Communicators CW - Cooperative Workers
PS- Numeric Problem Solvers EL- Effective Leaders
CT - Creative and Critical Thinkers MS - Multiculturally Sensitive Citizens
EW - Responsible and Ethical Workers PI - Parental Involvement
RM - Resource Managers

Strand 5: Technology	Standard 5.1 Integrates academic and applied technology principles into the workplace.										
Benchmark	**Sample Performance Description**	IM	EC	PS	CT	EW	RM	SM	CW	EL	MS	PI
5.1.1.1 Analyzes "best simple technology" to perform simple academic tasks (i.e. crayons, computers, etc.).	→ Uses trial and error to solve problems. → Experiments with various tools to solve problems.	✓	✓	✓	✓	✓	✓	✓	✓	✓		✓
5.1.1.2 Uses technology to improve school related skills.	→ Uses computer, games, art, music, activities to improve skill.	✓	✓	✓	✓	✓	✓	✓	✓	✓		✓
Strand 5: Technology	**Standard 5.2 Applies appropriate technology to an industry to solve technical and production problems.**	IM	EC	PS	CT	EW	RM	SM	CW	EL	MS	PI
5.2.1.1 Uses technology in "just in time" learning settings. (e.g., Applies computer software to complete a class project).	→ Uses a calculator to expedite problem solving. → Selects tools for the task. → Accesses information via a media center or learning center.	✓	✓	✓	✓		✓	✓	✓	✓		✓

Primary (Pre-K through 2)		IM - Information Managers EC - Effective Communicators PS- Numeric Problem Solvers CT - Creative and Critical Thinkers EW - Responsible and Ethical Workers RM - Resource Managers						SM - Systems Managers CW - Cooperative Workers EL- Effective Leaders MS - Multiculturally Sensitive Citizens PI - Parental Involvement				
Strand 6: Labor	**Standard 6.1: Demonstrates an understanding of labor issues related to the work place.**											
Benchmark	**Sample Performance Description**	IM	EC	PS	CT	EW	RM	SM	CW	EL	MS	PI
6.1.1.1 Shares responsibility with others in small group work.	→ Uses positive language when working with others.	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
6.1.1.2 Demonstrates leadership abilities.	→ Takes initiative to start a task. → Willingness to share ideas.	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Strand 7: Community Issues	**Standard 7.1 Analyzes and communicates the impact that industry and the community have on each other and on the individual.**	IM	EC	PS	CT	EW	RM	SM	CW	EL	MS	PI
7.1.1.1 Demonstrates awareness of the intra-dependence of local industries, the community, and themselves.	→ Demonstrates awareness of community helpers and their relationships. → Demonstrates awareness of family roles and responsibilities. → Demonstrates role in the classroom and school.	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓

Primary (Pre-K through 2)

IM - Information Managers
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Strand 8: Health, Safety, and Environment

Standard 8.1 Analyzes and communicates health and safety issues in the workplace and community.

Benchmark	Sample Performance Description	IM	EC	PS	CT	EW	RM	SM	CW	EL	MS	PI
8.1.1.1 Demonstrates awareness of health related habits and activities, i.e. hand washing, eating, drinking.	→ Demonstrates proper hand washing task and habits. → Demonstrates appropriate eating habits and manners. → Appreciates importance of physical exercise. → Demonstrates positive mental attitude.	✓	✓			✓	✓	✓	✓	✓	✓	✓
8.1.1.2 Demonstrates awareness of unhealthy habits and activities.	→ Identifies consequences of smoking, drugs, uncleanliness, and inappropriate behavior. → Discusses Just Say No campaign.	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
8.1.1.3 Demonstrates awareness of safety practices.	→ Demonstrates stop, drop, and roll for fire evacuation. → Discusses safety procedures for school, home, and pleasure. → Identify safety helpers.	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
8.1.1.4 Demonstrates awareness of safety hazards.	→ Exposed electrical cords. → Completes check for safety hazards.	✓	✓	✓	✓	✓	✓	✓	✓			
8.1.1.5 Demonstrates awareness of dangerous items in school and at home.	→ Safety check lists. → Develop book on safety.	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
8.1.1.6 Demonstrates knowledge of how to get help for emergencies.	→ Demonstrates use of 911.	✓	✓	✓	✓	✓	✓	✓				

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Primary (Pre-K through 2)		IM - Information Managers EC - Effective Communicators PS- Numeric Problem Solvers CT - Creative and Critical Thinkers EW - Responsible and Ethical Workers RM - Resource Managers						SM - Systems Managers CW - Cooperative Workers EL- Effective Leaders MS - Multiculturally Sensitive Citizens PI - Parental Involvement				
Strand 9: Personal Conduct	**Standard 9.1 Demonstrates an understanding of professional conduct in personal roles, as well as in work and industry.**											
Benchmark	**Sample Performance Description**	IM	EC	PS	CT	EW	RM	SM	CW	EL	MS	PI
9.1.1.1 Follows classroom rules for behavior.	- Uses stop sign as model to communicate behavior performances stop-red, think-yellow, do-green. - Discusses appropriate behaviors. - Contributes to development of classroom rules.	✓	✓		✓	✓	✓	✓	✓	✓	✓	✓
9.1.1.2 Demonstrates positive interpersonal skills, teamwork, and a work ethic in class work.	- Communicates classroom rules. - Demonstrates the ability to indicate and maintain contact with a peer. - Listening skills. - Participates in team games. - Completes self-initiated projects.	✓	✓		✓	✓	✓	✓	✓	✓	✓	✓

Intermediate (3-5)

IM - Information Managers
EC - Effective Communicators
PS - Numeric Problem Solvers
CT - Creative and Critical Thinkers
EW - Responsible and Ethical Workers
RM - Resource Managers
SM - Systems Managers
CW - Cooperative Workers
EL - Effective Leaders
MS - Multiculturally Sensitive Citizens
PI - Parental Involvement

Strand 1: Planning	Standard 1.1: Applies planning methods to decision-making related to life and work roles.										
Benchmark	**Performance Activity**	IM	EC	PS	CT	EW	RM	SM	CW	EL	MS	PI
1.1.2.1 Demonstrates knowledge of a planning process.	- Prepare an itinerary for a field trip. - Plan a science fair project. - Plan a program for parents.	√	√		√		√	√		√		√
1.1.2.2 Demonstrates ability to plan ahead for different types of events.	- Plan, schedule, and implement a community, science, literature, school or service project.	√	√	√	√	√	√	√	√	√	√	√
Strand 2: Management	**Standard 2.1: Employs management techniques to manage projects and enterprises related to work and life roles.**	IM	EC	PS	CT	EW	RM	SM	CW	EL	MS	PI
2.1.2.1 Demonstrates ability to work in cooperative group/teams taking turns at managing and making decisions.	- Cooperatively write, edit, illustrate, and proof read a book. - Cooperatively write, edit, illustrate, proof, and test technical guide sheets for classroom equipment operation.	√	√		√	√	√	√	√	√	√	√
2.1.2.2 Demonstrates ability to integrate planning and time management in the process of decision making within their teams.	- Cooperatively develop guidelines and time lines for completion of projects.	√	√	√	√	√	√	√	√	√	√	√
2.1.2.3 Demonstrates ability to reflect on decisions and analytically report them.	- Conduct survey of interest to students or the community and report the results. - Analyze election results and develop a report after studying candidate's platforms, issues, and spending.	√	√	√	√	√	√	√	√	√	√	√

Intermediate (3-5)

IM - Information Managers
EC - Effective Communicators
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CT - Creative and Critical Thinkers
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RM - Resource Managers
SM - Systems Managers
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EL - Effective Leaders
MS - Multiculturally Sensitive Citizens
PI - Parental Involvement

Strand 2: Management	Standard 2.2: Applies marketing and promotional techniques to products and services in a business or social setting.										
Benchmark	**Performance Activity**	IM	EC	PS	CT	EW	RM	SM	CW	EL	MS	PI
2.2.2.1 Develops rudimentary media for promoting institutional purposes.	→ Develop posters, signs, brochures, school public address system, or T.V. announcements promoting a class, school, or community project.	√										
Strand 2: Management	**Standard 2.3: Demonstrates knowledge and abilities necessary as a contract employee or to initiate and maintain a service or product based business.**	IM	EC	PS	CT	EW	RM	SM	CW	EL	MS	PI
2.3.2.1 Demonstrates understanding that there are different types of business ownership.	→ Identifies different types of business ownership found in the community: corporations, partnership, sole proprietorship, and cooperatives, locally owned, national chains, or franchises.	√	√	√	√	√	√	√	√	√	√	√
Strand 3: Finance	**Standard 3.1 Demonstrates financial planning ability and decision-making related to work and life roles.**	IM	EC	PS	CT	EW	RM	SM	CW	EL	MS	PI
3.1.2.1 Develops a financial plan for an event (field trip, class party, family vacation, or other functions).	→ Projects costs for a school or community event. → Develops a plan to fund or provide resources for a school or community event.	√	√	√	√	√	√	√	√	√	√	√
3.1.2.2 Relates accounting for a school or personal function (such as a club), to the budget process for school or business.	→ Compares and contracts different types of budgets. → Develops a budget for personal goals, and monitors expenditures for a period of time.	√	√	√	√	√	√	√	√	√	√	√

Intermediate (3-5)

IM - Information Managers SM - Systems Managers
EC - Effective Communicators CW - Cooperative Workers
PS - Numeric Problem Solvers EL - Effective Leaders
CT - Creative and Critical Thinkers MS - Multiculturally Sensitive Citizens
EW - Responsible and Ethical Workers PI - Parental Involvement
RM - Resource Managers

Benchmark	Performance Activity	IM	EC	PS	CT	EW	RM	SM	CW	EL	MS	PI
Strand 4: Technical and Production Skills in the Work Place	**Standard 4.1 Organizes work assignments by demonstrating production techniques.**											
4.1.2.1 Applies a variety of organizational and procedural skills to assignments and projects in school or community.	- Uses quality tools to graphically show processes or relationship between tasks, projects, or subjects.	√	√	√	√	√	√	√	√	√	√	√
4.1.2.2 Performs all assigned tasks and/or roles in a cooperative group or unit (e.g., job rotation or cross training).	- Performs a variety of roles in group settings and on teams.	√	√	√	√	√	√	√	√	√	√	√
Strand 5: Technology	**Standard 5.1 Integrates academic and applied technology principles into the workplace**	IM	EC	PS	CT	EW	RM	SM	CW	EL	MS	PI
5.1.2.1 Creates a simple technology-based project applying math, science, social studies, and language arts skills.	- Develops a multi-media report on a topic or area of career or life interest.	√	√	√	√	√	√	√	√	√	√	√
Strand 5: Technology	**Standard 5.2 Applies appropriate technology to an industry to solve technical and production problems.**	IM	EC	PS	CT	EW	RM	SM	CW	EL	MS	PI
5.2.2.1 Solves problems by using appropriate technology and "just in time" learning (e.g., applies computer software to solve problems).	- Demonstrates use of technology needed to present solutions to a variety of problems in the classroom, community or organization. - Presents solutions to problems using more than one media or method.	√	√	√	√	√	√	√	√	√	√	√

Intermediate (3-5)		IM - Information Managers EC - Effective Communicators PS - Numeric Problem Solvers CT - Creative and Critical Thinkers EW - Responsible and Ethical Workers RM - Resource Managers						SM - Systems Managers CW - Cooperative Workers EL - Effective Leaders MS - Multiculturally Sensitive Citizens PI - Parental Involvement				
Strand 6: Labor	**Standard 6.1 Demonstrates an understanding of labor issues related to the work place.**											
Benchmark	**Performance Activity**	IM	EC	PS	CT	EW	RM	SM	CW	EL	MS	PI
6.1.2.1 Completes assigned tasks in work related projects in a high quality and timely manner.	→ Demonstrates quality performance in projects and activities.	√	√	√	√	√	√	√	√	√	√	√
6.1.2.2 Works as a team member on projects.	→ Demonstrates positive team worker attributes.	√	√	√	√	√	√	√	√	√	√	√
6.1.2.3 Leads team members on project.	→ Provides leadership in a variety of tasks and areas in school, social situation, and the community.	√	√	√	√	√	√	√	√	√	√	√
Strand 7: Community Issues	**Standard 7.1 Analyzes and communicates the impact that industry and the community have on each other and on the individual.**	IM	EC	PS	CT	EW	RM	SM	CW	EL	MS	PI
7.1.2.1 Analyzes the importance of industry and the community to each other.	→ Studies and reports on the importance of a particular career field or industry to the community, state, or nation.	√	√	√	√	√	√	√	√	√	√	√

Intermediate (3-5)

IM - Information Managers
EC - Effective Communicators
PS - Numeric Problem Solvers
CT - Creative and Critical Thinkers
EW - Responsible and Ethical Workers
RM - Resource Managers
SM - Systems Managers
CW - Cooperative Workers
EL - Effective Leaders
MS - Multiculturally Sensitive Citizens
PI - Parental Involvement

Strand 8: Health, safety and Environment	Standard 8.1 Analyzes and communicates health and safety issues in the workplace and community.											
Benchmark	**Performance Activity**	IM	EC	PS	CT	EW	RM	SM	CW	EL	MS	PI
8.1.2.1 Demonstrates healthy habits in and out of school.	→ Documents and reports on personal health habits, including cleanliness, exercise, sleep, and eating habits.	√	√	√	√	√	√	√	√	√	√	√
8.1.2.2 Demonstrates safety practices in and out of school.	→ Studies and reports on safety practices in the classroom, home, and community.	√	√	√	√	√	√	√	√	√	√	√
8.1.2.3 Identifies problems related to workplace, community, and environment.	→ Researches and plans for improvement of problems affecting the home, community or work place.	√	√	√	√	√	√	√	√	√	√	√
8.1.2.4 Knows where to get information or help in dealing with health and safety issues.	→ Accesses informatn is from a variety of resources including Internet, CD Roms, school or community personnel, libraries, museums, home, and companies.	√	√	√	√	√	√	√	√	√	√	√
Strand 9: Personal Conduct	**Standard 9.1 Demonstrates an understanding of professional conduct in personal roles, as well as in work and industry.**	IM	EC	PS	CT	EW	RM	SM	CW	EL	MS	PI
9.1.2.1 Analyzes and conforms to classroom rules for individual and group work.	→ Demonstrates high standards through personal and professional behavior.	√	√	√	√	√	√	√	√	√	√	√
9.1.2.2 Demonstrates ability to work effectively and positively with diverse peers and adults displaying appropriate behavior.	→ Works effectively in a variety of situations with different types of individuals.	√	√	√	√	√	√	√	√	√	√	√
9.1.2.3 Recognizes the importance and need for high standards of professional conduct in both personal and work roles.	→ Demonstrates respect for individual differences from the student in learning, social, and work related settings.	√	√	√	√	√	√	√	√	√	√	√

Middle School (6-8)

IM - Information Managers SM - Systems Managers
EC - Effective Communicators CW - Cooperative Workers
CT - Creative and Critical Thinkers MS - Multiculturally Sensitive Citizens
EW - Responsible and Ethical Workers PI - Parental Involvement
RM - Resource Managers

Strand 1: Planning	Standard 1.1: Applies planning methods to decision-making related to life and work roles.										
Benchmark	**Sample Performance Description**	IM	EC	PS	CT	EW	RM	SM	CW	EL	MS	PI
1.1.3.1 Demonstrates the steps involved in planning and organizing an event or activity.	→ Develops sequential plans for projects, activities, or events.	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
1.1.3.2 Creates a written plan for different types of products, projects, or events using appropriate planning methods.	→ Uses graphic organizers to demonstrate through planning processes.	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
1.1.3.3 Demonstrates ability to research, conduct, and evaluate a long term project or experiment.	→ Develops timeline and evaluation strategies showing who, what, where, and how something is assessed.	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Strand 2: Management	**Standard 2.1: Employs management techniques to manage projects and enterprises related to work and life roles.**	IM	EC	PS	CT	EW	RM	SM	CW	EL	MS	PI
2.1.3.1 Recognizes the need to work in a diverse collaborative group to design, fabricate, distributes, and dispose/recycle products or services.	→ Works with a variety of individuals to accomplish goals, projects, or assignments.	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
2.1.3.2 Analyzes management systems for a project or enterprise, both personally and in the work place.	→ Reviews and selects the appropriate management tools for addressing use of time, resources, or personal communications.	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
2.1.3.3 Applies current management systems to school based projects or enterprises.	→ Demonstrates use of charts, checklists, graphic organizers, and other management tools to complete tasks or projects.	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓

Middle School (6-8)

IM - Information Managers
EC - Effective Communicators
PS- Numeric Problem Solvers
CT - Creative and Critical Thinkers
EW - Responsible and Ethical Workers
RM - Resource Managers
SM - Systems Managers
CW - Cooperative Workers
EL- Effective Leaders
MS - Multiculturally Sensitive Citizens
PI - Parental Involvement

Strand 2: Management	Standard 2.2: Applies marketing and promotional techniques to products and services in a business or social setting.										
Benchmark	**Sample Performance Description**	IM	EC	PS	CT	EW	RM	SM	CW	EL	MS	PI
2.2.3.1 Creates simple product or service and develops testing, production, distribution, marketing and disposal systems.	- Plans, develops, tests, and improves product or service.	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Strand 2: Management	**Standard 2.3: Demonstrates knowledge and abilities necessary as a contract employee or to initiate and maintain a service or product based business.**	IM	EC	PS	CT	EW	RM	SM	CW	EL	MS	PI
2.3.3.1 Researches and creates a model for a student owned business.	- Develops an employee payment system for work within a school or student operated enterprise.	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Strand 3: Finance	**Standard 3.1 Demonstrates financial planning ability and decision-making related to work and life roles.**	IM	EC	PS	CT	EW	RM	SM	CW	EL	MS	PI
3.1.3.1 Develops a budget and makes decisions required for achieving a balanced project budget.	- Cooperatively designs and implements a budget for a project or enterprise.	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
3.1.3.2 Develops a financial plan for both work and personal goals.	- Develops, implements, and adjusts a personal budget and savings plan .	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
3.1.3.3 Creates written accounts for budgets and rationale for financial decisions.	- Develops, implements, and adjusts an accounting system for school related projects and work.	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓

Middle School (6-8)

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Strand 4: Technical and Production Skills in the Work Place	Standard 4.1 Organizes work assignments by demonstrating production techniques.										
Benchmark	**Sample Performance Description**	IM	EC	PS	CT	EW	RM	SM	CW	EL	MS	PI
4.1.3.1 Analyzes alternative production methods for production of products or services.	→ Identifies the pluses and minuses for each of several methods of completing a project or service.	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
4.1.3.2 Synthesizes cost of production and distribution with return and profit.	→ Reviews and analyzes profit and loss for specific products, services, or projects.	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
4.1.3.3 Applies a variety of technical skills to simple projects.	→ Utilizes technology and industry related tools to complete a school, community, or work related project.	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Strand 5: Technology	**Standard 5.1 Integrates academic and applied technology principles into the workplace.**	IM	EC	PS	CT	EW	RM	SM	CW	EL	MS	PI
5.1.3.1 Analyzes technologies available to assist with a problem's solution and uses academic skills to research, adopt, or develop and evaluate a "best solution."	→ Uses scientific problem solving method to select technologies for specific class, work, or career related projects.	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
5.1.3.2 Develops solutions to workplace and life role problems that require higher level math, science, and technical communication skills.	→ Problem solves using case studies, projects, or examples that are found in the community, business, or school.	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
5.1.3.3 Uses applied technology and workplace examples in academic disciplines to solve problems.	→ Applies academic skills to solving workplace and real life problems and presenting recommendations or solutions to problems.	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓

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Strand 5: Technology	Standard 5.2 Applies appropriate technology to an industry to solve technical and production problems.										
Benchmark	**Sample Performance Description**	IM	EC	PS	CT	EW	RM	SM	CW	EL	MS	PI
5.2.3.1 Applies problem solving skills to determine the level and suitability of various technologies needed to solve industry related problems.	- Demonstrates use of multimedia and various technological tools when solving workplace related problems or simulated situations in life.	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Strand 6: Labor	**Standard 6.1 Demonstrates an understanding of labor issues related to the work place.**	IM	EC	PS	CT	EW	RM	SM	CW	EL	MS	PI
6.1.3.1 Demonstrates team workskills in projects.	- Performs and evaluates a variety of team skills and roles.	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
6.1.3.2 Analyzes fair division of work in projects.	- Assumes fair share of tasks in project activities.	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
6.1.3.3 Evaluates self and peer performance on projects.	- Utilizes checklists and rubrics to assess follow through and performance of self and team members.	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
6.1.3.4 Directs others in group projects.	- Demonstrates leadership in teaching others skills and working on projects.	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓

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Strand 7: Community Issues

Standard 7.1 Analyzes and communicates the impact that industry and the community have on each other and on the individual.

Benchmark	Sample Performance Description	IM	EC	PS	CT	EW	RM	SM	CW	EL	MS	PI
7.1.3.1 Utilizes current social, economic, political, and/or environmental issues or data as a basis for analyzing the impact that the community and industry have on each other.	- Develops consequence, diagrams which demonstrate study of community and industry issues and impact.	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
7.1.3.2 Participates in social and or environmental projects which impact the school and/or community.	- Participates in debates, campaigns, field-based study, and presentations of school, community, and industry impact studies and issues. - Utilizes a variety of school based, work based, and community resources to research and report on workplace, industry, or community concerns. - Utilizes technology available to the school, industry, and community to explore questions of career or personal interest to the student.	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓

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Strand 8: Health, Safety and Environment

Standard 8.1 Analyzes and communicates health and safety issues in the workplace and community.

Benchmark	Sample Performance Description	IM	EC	PS	CT	EW	RM	SM	CW	EL	MS	PI
8.1.3.1 Demonstrates an understanding of health and safety issues in and out of the school.	→ Demonstrates appropriate health habits including diet, exercise, cleanliness, and leisure time use. → Models respect for safety rules in all school related activities. → Follows safety rules in classrooms, school laboratories, and grounds. → Refrains from endangering others by attending to or reporting unsafe situations immediately. → Studies safety and health issues in the home and community.	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
8.1.3.2 Demonstrates an understanding of environmental problems that impact health and safety.	→ Utilizes consequence decision trees and other organizers to explain environmental problems related to health and safety.	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
8.1.3.3 Utilizes analysis and problem-solving skills to find solutions for environmental concerns affecting the school.	→ Cooperates with others to identify and solve problems related to the school or community. → Works with local businesses to identify local environmental concerns.	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
8.1.3.4 Identifies where and how to get information or help concerning health and safety issues.	→ Uses various resources to obtain information and statistics relating to health and safety issues.	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓

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Strand 9: Personal Conduct

Standard 9.1 Demonstrates an understanding of professional conduct in personal roles, as well as in work and industry.

Benchmark	Sample Performance Description	IM	EC	PS	CT	EW	RM	SM	CW	EL	MS	PI
9.1.3.1 Develops and conforms to group and individual conduct guidelines.	→ Develops quality indicators in planning behavior guudelines for a variety of sutuations. → Works cooperatively to develop individual behavior expectations in individual and team situations.	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
9.1.3.2 Demonstrates interpersonal skills which enhance team productivity and foster positive work attitudes.	→ Demonstrates teamworking skills in a variety of situations.	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓

High School (9-12)		IM - Information Managers EC - Effective Communicators PS - Numeric Problem Solver CT - Creative and Critical Thinkers EW - Responsible and Ethical Workers RM - Resource Managers										
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Strand 1: Planning	**Standard 1.1: Applies planning methods to decision-making related to life and work roles.**											
Benchmark	**Sample Performance Descriptions**	IM	EC	PS	CT	EW	RM	SM	CW	EL	MS	PI
1.1.4.1 Demonstrates ability to gather information from various sources to plan a project.	→ Explain how to locate all pertinent information for an industry manufacturer who is thinking of building a plant in the community. Include transportation, zoning, construction cost, labor market, tax, and tax incentive considerations.	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
1.1.4.2 Creates a collaborative and comprehensive plan which addresses specific events, products, or projects either personally or for the work place.	→ Use real life case problems for students to solve through use of a variety of problem solving strategies. The following provides an example: each week of the school year one classroom/lab will be shut down for remodeling. Using blueprints and class schedules have the students devise a plan that includes a list of which classroom will be shut down each week, and where will the students from that class go?	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
1.1.4.3 Demonstrates knowledge of planning processes in an industry.	→ With team members, list in sequential order the planning process for bringing a new product to the U.S. market.	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓

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Strand 2: Management

Standard 2.1: Employs management techniques to manage projects and enterprises related to work and life roles.

Benchmark	Sample Performance Descriptions	IM	EC	PS	CT	EW	RM	SM	CW	EL	MS	PI
2.1.4.1 Develops the planning, implementation, fiscal, and evaluation systems necessary to manage a project or provide a service.	- In reasonable detail, describe a hypothetical business to be started in the community. Participate on a team for one of the following: planning, fiscal, implementation, or evaluation. List, describe, and be prepared to defend the tools needed for the particular area.	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
2.1.4.2 Analyzes the managerial skills necessary for decision making in different work related situations.	- List the managerial skills needed in an industry or career cluster of interest to the student. Graphically display, describe, and discuss the managerial skills common to all industries, and those unique to the one of personal interest.	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓

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Strand 2: Management

Standard 2.2: Applies marketing and promotional techniques to products and services in a business or social setting.

Benchmark	Sample Performance Descriptions	IM	EC	PS	CT	EW	RM	SM	CW	EL	MS	PI
2.2.4.1 Analyzes concepts of supply & demand and how these apply to promotion in a specific industry.	→ Analyze the marketing and promotional campaign of an industry with an abundance of production capacity (such as autos, computers, stereo equipment, etc.). Discuss a marketing and promotional campaign for the same industry but assuming production capacity was only 90% of demand.	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
2.2.4.2 Analyzes concepts of diminishing returns and how it applies to marketing and promotion of a specific industry.	→ Solve case problems like the following: television sets were only in a few households in the early '50s compared to multiple sets in nearly every home today. Have students list possible promotion strategies for both time periods, and discuss the differences and similarities of the two strategies.	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
2.2.4.3 Analyzes various marketing systems and the methods used within each (including media, i.e. mail/catalog sales, retail and sales of services vs. products).	→ Keep a log for a period of time (1 or 2 weeks) describing all advertisements and promotions encountered during that time, for a particular industry including T.V., radio, newspapers, magazines, billboards, mail, displays in stores, etc. Categorize and discuss.	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
2.2.4.4 Analyzes the general characteristics of a promotional campaign for products or services. (Such as: determine target market and what is involved in the designing of an advertisement campaign directed towards that market).	→ Devise a complete advertising campaign for a school, community, or work based project. For example, for the school yearbook. Use video clips, brochures, posters, announcements, mail-outs, etc.	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
2.2.4.5 Develops an advertising campaign using a variety of techniques and technology for an industry.	→ Develop an advertising campaign for a popular teenage product (Sega Genesis, apparel, board groups, etc.) . Describe a theme advertisement campaign, including time slots, picture location, promotional ideas, etc. Use local or area media information to complete the project.	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓

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Strand 2: Management

Standard 2.3: Demonstrates knowledge and abilities necessary as a contract employee or to initiate and maintain a service or product based business.

Benchmark	Sample Performance Descriptions	IM	EC	PS	CT	EW	RM	SM	CW	EL	MS	PI
2.3.4.1 Analyzes the different types of business ownership and the positive and negative aspects of each.	→ Discuss the three basic forms of business ownership (proprietorship, partnership, and corporation), determine the best form of ownership for selected industries or career pathways.	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
2.3.4.2 Demonstrates a basic understanding of various resources and skills required to initiate and maintain a business.	→ Debate the pros and cons of various types of ownership for given situations. Interview local entrepreneurs. Using a check list of questions, the students should determine why they selected the location they did, the amount of start-up capital required, normal inventory amounts, the type and cost of advertising, the number and skill level of employees, cash flow projections, etc. → Using checklists and other resources for success in business, analyze personal strengths and weaknesses in knowledge and skills required for success in a particular business or industry and develop a plan to overcome weaknesses. → On a team, select a business that your team wants to start and operate. Develop a comprehensive business plan including initial capital requirements, location, start-up inventory, cash flow estimates, advertising campaign, personnel requirements, present team plan to business partners role playing potential investors from the community.	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓

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Strand 3: Finance

Standard 3.1 Demonstrates financial planning ability and decision-making related to work and life roles.

Benchmark	Sample Performance Descriptions	IM	EC	PS	CT	EW	RM	SM	CW	EL	MS	PI
3.1.4.1 Develops a budget, financial plan, and cash flow projections for a team project.	→ Split the class into teams and have each team select a school sanctioned sport. Each team will interview the appropriate coaches and other personnel to determine the complete cost of having that sport at school. The costs should include uniforms, equipment (cost and expected life), travel expense, maintenance costs, coaching salaries, etc. Then each team is to determine income sources, such as sponsorships, ticket sales, concession, student fees, fund raisers, etc. → Participate and form teams and select a major class project for which to develop a full competitive proposal, i.e. senior trip, prom, graduation, year book, school enterprise, and develop a financial plan and projections to successfully implement the project, including checks and balance.	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
3.1.4.2 Reconciles income and expense accounts in a work place situation to determine profit/loss.	→ Using the data from one of the above projects, develop a cash flow statement and an income (profit/loss) statement.	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
3.1.4.3 Completes simple tax forms required of employees.	→ Invite local business people to speak to the class concerning the various tax forms required for their business operation. Ask selected business people to bring copies of various tax forms such as payroll deduction tax, sales tax, business/inventory tax forms, etc. → Complete personal tax forms for part-time employment.	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓

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Strand 3: Finance

Standard 3.1 Demonstrates financial planning ability and decision-making related to work and life roles.

Benchmark	Sample Performance Descriptions	IM	EC	PS	CT	EW	RM	SM	CW	EL	MS	PI
3.1.4.4 Evaluates various retirement programs and investment options, (such as IRAs, 401K plans, etc.).	- Invite a financial planner to speak to the class about various retirement options. Ask them to show the tremendous difference in accumulated wealth when someone starts investing in their 20s vs. someone who doesn't start until their 40s. - Explain to other students the importance of early financial planning.	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
3.1.4.5 Evaluates personal insurance needs, (such as: health, life, disability, liability, etc.).	- Have each student develop a life plan for their insurance needs. Although health insurance is desirable at any age, have them project how much life insurance they need now, after marriage, after children, after children are gone, and after retirement. Have them investigate what type of life insurance is best for their needs i.e. whole life, universal life, term, declining balance life (usually mortgage insurance), etc. Have them discuss when it is appropriate to have disability insurance and/or liability insurance.	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓

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High School (9-12)

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EC - Effective Communicators CW - Cooperative Workers
PS - Numeric Problem Solver EL - Effective Leaders
CT - Creative and Critical Thinkers MS - Multiculturally Sensitive Citizens
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RM - Resource Managers

Strand 4: Technical and Production Skills in the Work Place

Standard 4.1 Organizes work assignments by demonstrating production techniques.

Benchmark	Sample Performance Descriptions	IM	EC	PS	CT	EW	RM	SM	CW	EL	MS	PI
4.1.4.1 Analyzes and describes the various industry methods of organizing the workplace to enhance productivity.	→ As a team member, investigate current industry workplace organization models including leased employment	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
4.1.4.2 Analyzes and describes the jobs required in an industry workplace.	→ Have a team of students choose a local manufacturer/production company or industry in which they have a common interest and as a group project have them obtain an organizational and staffing chart of all positions required within that business. Have them invite the company and personnel managers to participate on a panel to discuss what the industry looks for in employees.	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
4.1.4.3 Analyzes development of higher quality products or services using continuous quality improvement approach to industry related project.	→ Identifies components of international standards for organizations (ISO) and workplace skill standards for specific industries or career clusters required for employment in world class organizations.	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
4.1.4.4 Applies a variety of technical skills to industry specific projects.	→ Demonstrates workplace employment and technical skills required for entry into a career cluster or related industries.	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓

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Strand 5: Technology

Standard 5.1 Integrates academic and applied technology principles into the workplace

Benchmark	Sample Performance Descriptions	IM	EC	PS	CT	EW	RM	SM	CW	EL	MS	PI
5.1.4.1 Analyzes and displays examples of all academic disciplines related to industry.	→ Split the class into three groups, one for manufacturing/production, one for service, and one for retail. Have each group pick a specific business that falls into their area. Then have them develop a matrix, with the seven academic subject areas across the top and the various employment positions listed down on the left, and have the students check the intersecting boxes where skills are needed on the job. Have the groups conduct research or interviews to support their findings. → Discuss each groups findings.	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
5.1.4.2 Creates potential solutions to industry problems using math and/or scientific concepts and communicates solution using industry appropriate language arts and graphic skills.	→ Using the construction industry as an example, show how algebra and applied math are used in determining the materials needed for the construction of a building, how geometry and trigonometry are used in determining roof slope and staircases, how pneumatics are used for nail guns and jack hammers, how hydraulics allow heavy equipment to move vast quantities of earth. → Using major career clusters or related industries, conduct research to identify types of math, scientific, and communication skills required for various aspects and levels within the industry.	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓

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Strand 5: Technology

Standard 5.2 Applies appropriate technology to an industry to solve technical and production problems.

Benchmark	Sample Performance Descriptions	IM	EC	PS	CT	EW	RM	SM	CW	EL	MS	PI
5.2.4.1 Researches and analyzes the levels of technology applied in an industry.	→ Investigate local businesses and report on the various forms of technology being used by each business.	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
5.2.4.2 Applies technology in problem solving activities, as they relate to production.	→ Keep a learning log of student production (i.e. research, reports, etc.) and the sources used for research (i.e. Internet, CD ROMS, electronic encyclopedia, etc.) and the construction of the reports (i.e. word processing or desktop publishing programs, drawing programs, CAD programs, etc.). → Development technology use through student developmental portfolio.	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
5.2.4.3 Demonstrates an understanding of industry specific automated and electronically controlled systems and processes.	→ Participate in a field trip to a local or regional manufacturing company, and request that the "guide" explain the use of electronically controlled systems and devices. → Shadow in career related industries where students can investigate the use and types of technology required for efficiency in the industry in which they are interested.	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
5.2.4.4 Uses technologies to individually access information or tutorials as needed to complete a personal or industry related task, process, or project.	→ Using the facilities in the classroom, library, community or home use the Internet, CD ROMS, and any other available technology to obtain information concerning a specific industry.	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓

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Strand 6: Labor

Standard 6.1 Demonstrates an understanding of labor issues related to the work place.

Benchmark	Sample Performance Descriptions	IM	EC	PS	CT	EW	RM	SM	CW	EL	MS	PI
6.1.4.1 Analyzes social, legal, economic, and moral aspects of labor and management relationship.	→ Participate in a team which investigates typical labor and management roles and relationships in a career cluster or industry of personal interest. Areas may include wage rates, benefits, and employee turn-over . → Teams may report findings and analyze differences among industries.	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
6.1.4.2 Assigns tasks, coordinates work, and motivates peers at school, work, and sports or other social settings	→ Participate and document different roles including facilitator, team member, in projects related to studying all aspects of an industry. → Participates and documents various roles and experiences in school activities, (same as above) in organizations including clubs, professional associations, and service clubs in health and leisure activities.	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓

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Strand 7: Community Issues

Standard 7.1 Analyzes and communicates the impact that industry and the community have on each other and on the individual.

Benchmark	Sample Performance Descriptions	IM	EC	PS	CT	EW	RM	SM	CW	EL	MS	PI
7.1.4.1 Researches a given industry's data and reports its environmental, social, and economic impact on the community.	• Obtain reports on a local industry and interview executives of that industry to determine in its economic (payroll) and investments, social activities of the company (both economic and employee participation), and environment impact of how they dispose of their waste and emissions and the efforts they make to limit those wastes and emissions.	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
7.1.4.2 Researches various aspects of the local community, i.e. demographics, geography, and natural resources, etc., and reports on how it impacts on an industry.	• Obtain and use data from the local chamber of commerce and census data to obtain demographic information and natural resources to analyze potential benefits/deficiencies when trying to attract industry to the community. • Economic impact (payroll and investments in community) • Social impact (civil organizations and community involvement) • Environment impact	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓

High School (9-12)

IM - Information Managers
EC - Effective Communicators
PS - Numeric Problem Solver
CT - Creative and Critical Thinkers
EW - Responsible and Ethical Workers
RM - Resource Managers
SM - Systems Managers
CW - Cooperative Workers
EL - Effective Leaders
MS - Multiculturally Sensitive Citizens
PI - Parental Involvement

Strand 8: Health, Safety and Environment

Standard 8.1 Analyzes and communicates health and safety issues in the workplace and community.

Benchmark	Sample Performance Descriptions	IM	EC	PS	CT	EW	RM	SM	CW	EL	MS	PI
8.1.4.1 Develops an evaluation or instrument that deals with health and safety in workers' professional life.	→ Develop a comprehensive health and safety plan for a school. → With one team, select major industries or career clusters, research and develop health and safety strategies for employees in the field.	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
8.1.4.2 Researches various environmental problems and report on those that impact occupational health and safety within a specific industry.	→ Discuss environmental concerns in their community. → Select one problem and research the cause and efforts being made to eliminate or reduce that problem. → Develop and implement a progressive plan to continue to improve the environment.	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
8.1.4.3 Analyzes federal and state safety laws and regulations (such as OSHA) as they relate to specific system of an industry.	→ Select a local industry to investigate concerning the various laws and labor laws for that industry.	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
8.1.4.4 Evaluates methods to resolve environmental problems.	→ Identify and research local national issues related to environmental protection. → Participate with industry and community groups to improve the work and community environment. → Use industry quality standards and tools and assessment techniques to evaluate a variety of environmental problems.	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓

High School (9-12)

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Strand 9: Personal Conduct

Standard 9.1 Demonstrates an understanding of professional conduct in personal roles, as well as in work and industry.

Benchmark	Sample Performance Descriptions	IM	EC	PS	CT	EW	RM	SM	CW	EL	MS	PI
9.1.4.1 Researches and analyzes a code of professional conduct for an industry in the workplace.	→ Select an industry or career area , service business, or retail business and research the code of ethics form teams to compare and have class discussion concerning the similarities of the codes.	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
9.1.4.2 Demonstrates the ability to cooperatively work in various settings, across diverse populations.	→ Participates in groups, associations, clubs, and activities as a team member, leader, or supporter.	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
9.1.4.3 Facilitates the business/education partnership in the development of joint goals.	→ Work with teachers, counselors, workplace mentors, and others in developing and implementing plans for improving learning, educational opportunities, business or the community. → Work with business partners on projects of mutual benefit after setting cooperative goals.	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓

Post-Secondary (13,14, & Adult)

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Strand 1: Planning

Standard 1.1: Applies planning methods to decision-making related to life and work roles.

Benchmark	Sample Performance Description	IM	EC	PS	CT	EW	RM	SM	CW	EL	MS	PI
1.1.5.1 Demonstrates organization and planning processes used in the industry.	→ Develops a proposal for a customer.	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
1.1.5.1a Researches and analyzes needs, customer concerns, problems, to be addressed.	→ Troubleshoots a problem presented by a customer.		✓		✓	✓	✓	✓	✓	✓		
1.1.5.1b Uses activities, time lines, & responsibilities in planning projects and goal setting.	→ Gives an estimate for an industrial or work related project.	✓	✓		✓	✓	✓	✓	✓	✓		
1.1.5.1c Develops and implements the plan based on a needs assessment.	→ Provides a written plan to solve a work related problem.	✓	✓		✓	✓	✓	✓	✓	✓		
1.1.5.1d Creates and implements measurement to determine continuance, adjustment, or termination.	→ Uses graphic organizers appropriately for planning.	✓	✓		✓	✓	✓	✓	✓	✓		
1.1.5.1e Allocates resources for implementation of the plan.												
1.1.5.1f Evaluates the planning process and the plan implementation.												

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Strand 2: Management

Standard 2.1: Employs management techniques to manage projects and enterprises related to work and life roles.

Benchmark	Sample Performance Description	IM	EC	PS	CT	EW	RM	SM	CW	EL	MS	PI
2.1.5.1 Researches, analyzes, and selects the most appropriate management systems for a specific situation.	→ Researches current management practices and applies practices appropriately.	✓	✓	✓	✓	✓	✓	✓	✓	✓		
2.1.5.2 Develops an appropriate management plan.	→ Outlines or graphically organizes a management plan for a given situation.		✓	✓	✓	✓	✓	✓	✓	✓		
2.1.5.3 Demonstrates industry specific decision making and critical thinking skills.	→ Thinks through and recommends appropriate action for work or life role problems.	✓	✓		✓	✓		✓	✓	✓		
2.1.5.4 Applies resource management techniques in planning and implementing processes.	→ Demonstrates appropriate management of time, people, and other resources.	✓	✓	✓	✓	✓	✓	✓	✓	✓		
2.1.5.5 Applies problem solving process to industry related management issues or projects.	→ Recommends appropriate solutions to industry related problems.	✓	✓		✓	✓	✓	✓	✓	✓		

Post-Secondary (13,14, & Adult)		IM - Information Managers EC - Effective Communicators PS- Numeric Problem Solvers CT - Creative and Critical Thinkers EW - Responsible and Ethical Workers RM - Resource Managers						SM - Systems Managers CW - Cooperative Workers EL- Effective Leaders MS - Multiculturally Sensitive Citizens PI - Parental Involvement				
Strand 2: Management	**Standard 2.2: Applies marketing and promotional techniques to products and services in a business or social setting.**											
Benchmark	**Sample Performance Description**	IM	EC	PS	CT	EW	RM	SM	CW	EL	MS	PI
2.2.5.1 Develops a complete marketing system, including:	- Analyzes marketing systems used in a given industry.	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
2.2.5.1a Develops promotional campaign for a specific business or industry in a collaborative manner.	- Develops improved systems, products and processes for marketing in a specific industry or career area.	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
2.2.5.1b Designs a distribution system for products or services.												
2.2.5.1c Analyzes and uses market research procedures.												
2.2.5.1d Establishes strategic goals.												
2.2.5.1e Develops a feedback system via customer responses, questionnaires, and surveys.												
2.2.5.1f Develops a plan that is enticing to the diverse population, without being inflammatory to any other group.												
2.2.5.1g Projects and monitors market share.												

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Strand 2: Management

Standard 2.3: Demonstrates knowledge and abilities necessary as a contract employee or to initiate and maintain a service or product based business.

Benchmark	Sample Performance Description	IM	EC	PS	CT	EW	RM	SM	CW	EL	MS	PI
2.3.5.1 Develops a comprehensive plan to initiate and maintain a specific business, including:	→ Develops a comprehensive business plan for a given business or enterprise.	✓	✓	✓	✓	✓	✓	✓	✓	✓		
2.3.5.1a Analyzes the amount of capital needed and the various sources for that capital.												
2.3.5.1b Determines location and type of facilities required.												
2.3.5.1c Analyzes choice of buy, build, or lease.												
2.3.5.1d Researches all licenses, certificates, insurance, and approvals needed for the business.												
2.3.5.1e Develops appropriate systems for setting prices, inventory control, invoicing procedures, initial and long term marketing plan, cash flow, accounting procedures, and reports.												

Post-Secondary (13,14, & Adult)

Strand 3: Finance

Standard 3.1 **Demonstrates financial planning ability and decision-making related to work and life roles.**

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Benchmark	Sample Performance Description	IM	EC	PS	CT	EW	RM	SM	CW	EL	MS	PI
3.1.5.1 Develops a financial plan, including cash flow projections, tax considerations, interest rate effects, etc.	→ Develops a financial plan for a given business.	✓	✓	✓	✓	✓	✓	✓	✓	✓		
.3.1.5.2 Develops and reconciles simple accounting for income and expense to budget and make financial decisions.	→ Analyzes past performance of a company in a specific industry.	✓					✓	✓				
3.1.5.3 Analyzes and researches sources, cost, and availability for start-up capital.	→ Develops a financial plan to initiate a new business.	✓	✓	✓	✓	✓	✓	✓	✓	✓		
3.1.5.4 Analyzes and prepares local, state, and federal forms necessary to enter business in a new or established industry.	→ Completes local, state, and federal forms required to enter business appropriately.	✓	✓	✓	✓	✓	✓	✓	✓	✓		
3.1.5.5 Analyzes methods of protecting, extending or leveraging personal net worth through insurance, tax-deferred options, real estate, and stock funds.	→ Develops a personal portfolio including strategies and goals for improving net worth.	✓	✓	✓	✓	✓	✓	✓	✓	✓		

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Strand 4: Technical and Production Skills in the Work Place

Standard 4.1 Organizes work assignments by demonstrating production techniques.

Benchmark	Sample Performance Description	IM	EC	PS	CT	EW	RM	SM	CW	EL	MS	PI
4.1.5.1 Develops an industry specific production plan analyzing alternate types of production models utilizing technology and ranking anticipated productivity and costs.	→ Develops a production plan and evaluation instrument for an industry related product, project, or services.	✓	✓	✓	✓	✓	✓	✓		✓		
4.1.5.2 Analyzes various production models including assembly line, job rotation, cross-trained workers, and production team.	→ Troubleshoots personal issues and recommends appropriate systems for improving production or service in a given industry related problem.	✓	✓	✓	✓	✓	✓	✓		✓	✓	
4.1.5.3 Applies a variety of technical skills to complex, long term industry specific projects.	→ Demonstrates technical skills required for proficiency in a given industry or career area.	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	

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Post-Secondary (13,14, & Adult)

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Strand 5: Technology	Standard 5.1 Integrates academic and applied technology principles into the workplace.										
Benchmark	**Sample Performance Description**	IM	EC	PS	CT	EW	RM	SM	CW	EL	MS	PI
5.1.5.1 Applies math and/or scientific concepts to industry related problems.	→ Utilizes proper academic skills to solve problems or improve situations in the workplace.	✓	✓	✓	✓	✓	✓	✓	✓	✓		
5.1.5.2 Applies necessary language arts/communication skills for a specific industry.	→ Utilizes appropriate communication skills to present information, train, or respond to an industry based situation.	✓	✓	✓	✓	✓	✓	✓	✓	✓		
5.1.5.3 Applies other academic skills,(i.e. health, social sciences, arts) required for specific industry situations.	→ Utilizes a wide knowledge base of academic skills to solve problems in a specific industry situation.	✓	✓	✓	✓	✓	✓	✓	✓	✓		
Strand 5: Technology	**Standard 5.2 Applies appropriate technology to an industry to solve technical and production problems.**	IM	EC	PS	CT	EW	RM	SM	CW	EL	MS	PI
5.2.5.1 Uses technology to trouble shoot, record, or predict industry-related problems.	→ Demonstrates appropriate use of tools of the industry to analyze problems.	✓	✓	✓	✓	✓	✓	✓	✓	✓		
5.2.5.2 Analyzes the suitability of various technologies to improve productivity of service, provide a product, or produce industrials.	→ Demonstrates appropriate tools of the industry to perform work tasks in the industry.	✓	✓	✓	✓	✓	✓	✓	✓	✓		
5.2.5.3 Routinely uses technologies learned "just in time" as required by new applications, code changes, and work requirements.	→ Demonstrates flexibility to adjust, and learn new processes and procedures as needed for workplace tasks.	✓	✓	✓	✓	✓	✓	✓	✓	✓		

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Strand 6: Labor

Standard 6.1 Demonstrates an understanding of labor issues related to the work place.

Benchmark	Sample Performance Description	IM	EC	PS	CT	EW	RM	SM	CW	EL	MS	PI
6.1.5.1 Analyzes the interrelationship of employer/employee legal and ethical rights and responsibilities in the workplace and community.	→ Demonstrates ethical behavior and understands legal rights of employees in the industry and community.	✓	✓		✓	✓	✓	✓	✓	✓		
6.1.5.2 Analyzes effects of collective bargaining, employee benefits, wage structures, and employment contracts.	→ Analyzes and makes decisions related to employment benefits, structures, and contracts based on industry options and trends.	✓	✓	✓	✓	✓	✓	✓	✓	✓		
6.1.5.3 Demonstrates an understanding of legal aspects of employer/employee relationships, including:	→ Communicates the importance of legal issues and appropriate behavior related to a specific industry or career area.	✓	✓	✓	✓	✓	✓	✓	✓	✓		
6.1.5.3a Recognizes issues relating to collective bargaining.												
6.1.5.3b Analyzes the terms and conditions of employment contracts.												
6.1.5.3c Analyzes labor law issues related to a specific industry.												

Post-Secondary (13,14, & Adult)

Strand 7: Community Issues

Standard 7.1 **Analyzes and communicates the impact that industry and the community have on each other and on the individual.**

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Benchmark	Sample Performance Description	IM	EC	PS	CT	EW	RM	SM	CW	EL	MS	PI
7.1.5.1 Identifies, researches, analyzes, and projects the impact of an industry on the environment in a community.	→ Recognizes the important contributions of both industry and the community to quality of life.	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
7.1.5.2 Develops a public relations plan to communicate the positive impact of an industry.	→ Selects media for publicizing positive industry news.	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
7.1.5.3 Identifies, researches, and analyzes the community's impact on and involvement with a local industry.	→ Communicates economic and environmental impact on the community of the industry or career area.	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
7.1.5.4 Develops a community relations plan to increase community involvement with local industry.	→ Identifies potential community involvement opportunities for employees of the industry.	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	

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Strand 8: Health, Safety and Environment

Standard 8.1 **Analyzes and communicates health and safety issues in the workplace and community.**

Benchmark	Sample Performance Description	IM	EC	PS	CT	EW	RM	SM	CW	EL	MS	PI
8.1.5.1 Researches, analyzes, and complies with federal and state health and safety laws and regulations for an industry.	→ Demonstrates strategies for complying with and documenting safety and regulations for the industry.	✓	✓		✓	✓	✓	✓	✓	✓		
8.1.5.2 Demonstrates best practices for health and safety in the workplace and community.	→ Designs health and safety practices for the industry workplace.	✓	✓		✓	✓	✓	✓	✓	✓		
8.1.5.3 Analyzes the environmental concerns of a specific industry.	→ Analyzes environmental impact of the industry in a community.	✓	✓	✓	✓	✓	✓	✓	✓	✓		
8.1.5.4 Compares the environmental impact of light and heavy industry in a community, as it relates to health, safety, and economic benefit.	→ Graphically organizes the impact of various industries on a communities quality of life.	✓	✓	✓	✓	✓	✓	✓	✓	✓		
8.1.5.5 Demonstrates ability to evaluate cost vs. benefit of environmental protection.	→ Analyzes long range cost and benefits of industry protecting the environment.	✓	✓	✓	✓	✓	✓	✓	✓	✓		
8.1.5.6 Projects, analyzes and implements a plan to solve an environmental dilemma in a community.	→ Develops a plan for industry involvement in solving related industry environmental problems.	✓	✓	✓	✓	✓	✓	✓	✓	✓		

Post-Secondary (13,14, & Adult)

Strand 9: Personal Conduct

Standard 9.1 **Demonstrates an understanding of professional conduct in personal roles, as well as in work and industry.**

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Benchmark	Sample Performance Description	IM	EC	PS	CT	EW	RM	SM	CW	EL	MS	PI
9.1.5.1 Exhibits a code of ethics in the workplace.	→ Demonstrates high ethical behavior and performance in the workplace.	✓	✓		✓	✓	✓	✓	✓	✓		
9.1.5.2 Utilizes self management techniques in both work and life roles.	→ Demonstrates time management goal orientation and resource management skills.	✓	✓	✓	✓	✓	✓	✓	✓	✓		
9.1.5.3 Demonstrates an understanding of responsibility in both work and life roles.	→ Demonstrates responsible action workplace and life roles.	✓	✓		✓	✓	✓	✓	✓	✓		
9.1.5.4 Displays integrity and honesty in all work and personal situations.	→ Demonstrates high performance and quality characteristics in the workplace and personal roles.	✓	✓	✓	✓	✓	✓	✓	✓	✓		
9.1.5.5 Creates a business and education partnership.	→ Develops a partnership with an education organization or business to improve self and learning situations.	✓	✓	✓	✓	✓	✓	✓	✓	✓		

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APPENDIX 4A

Instructional Strategies for a 21st Century Applied Technology Classroom

The strategies included in this section require students to learn in context with the real world. Most of the strategies which follow require active learning and higher level thinking from the students. The strategies are found in the literature related to "best practices" for teaching and learning.

Each strategy includes a basic definition, description of how to use it, and a short list of benefits of using the strategy. The selected resources are included here for further reflection. The Internet has many home pages with additional descriptions of strategies identified through "best practices" in the literature on education.

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Appendix 4A

Instructional Strategies for a 21st-Century Applied Technology Classroom

Multiple Intelligences	
What is it? There are many forms of intelligence, many ways by which we know, understand, and learn about the world. Seven intelligences have been identified: verbal/linguistic, logical/mathematical, visual/spatial, body/kinesthetic, musical/rhythmic, intra-personal, interpersonal.	
How do you use it? ■ Teachers incorporate the 7 ways of knowing into their lessons plans and students learn and demonstrate knowledge and skills through all intelligences ☞ ***Multiple Intelligences:*** *appropriate for all levels.*	**Benefits?** ■ Active learning ■ "Reach" all students ■ Process material in area(s) of strength ■ Goes beyond verbal and mathematical intelligences traditionally used in classrooms

Graphic Organizer	
What is it? Visual representations of abstract concepts and processes. Students transfer abstract information into a more concrete form.	
How do you use it? ■ Teacher provides a specific format for learning, recalling, and organizing ☞ ***Graphic Organizer****: appropriate from third grade through adult.*	**What are the benefits?** ■ Helps in transfer of learning from abstract to concrete ■ Helps visual learners organize ideas ■ Provides format for study ■ Used in business and industry for communication

Specific Graphic Organizer Strategies

Consequence Diagram/Decision Tree	
What is it? A graphic organizer strategy in which students use diagrams or decision trees to illustrate real or possible outcomes of different actions.	
How do you use it? ■ Learners visually depict possible outcomes for a given problem. The consequence diagram or tree usually includes geometric symbols, lines, and arrows. A rectangle shape indicates a start and stop point, a square indicates a step or process, a diamond represents a decision, a line and arrow indicates continue if yes, go back if no. ☞ ***Consequence Diagram/Decision Tree:*** *appropriate from third through adult.*	**What are the benefits?** ■ Helps in transferring learning to application ■ Aids in predicting with accuracy ■ Develops ability to identify the causes and effects of decisions ■ Provides an opportunity to infuse a multicultural perspective ■ Used in trouble shooting by many industries

Flowchart

What is it? A graphic organizer strategy in which students depict positioning and role relationships.

How do you use it?

- Students structure a sequential flow of events, actions, roles, and decisions graphically on paper. The visual is usually represented by a geometric symbol line, and arrows pointing in the direction of the flow.

☞ ***Flowchart:*** *appropriate from third grade through adult.*

What are the benefits?

- Fosters logical and sequential thinking
- Focuses on connections
- Develops ability to determine details, specific points
- Improves organizational skills
- Aids in planning
- Provides an outline for writing
- May be used to explore a multicultural perspective
- Used in industry to improve processes and products

Venn Diagram

What is it? A graphics organizer strategy for creating a visual analysis of information representing similarities and differences among concepts, objects, animals, etc.

How do you use it?

- Using two overlapping circles, students list unique characteristics of two items or concepts (one in left part of circle and one on right); in the middle they list shared characteristics.

☞ ***Venn Diagram:*** *appropriate from third grade through adult.*

What are the benefits?

- Helps students organize reading, ideas, and a plan for writing
- Focuses on comparisons
- Requires students to draw conclusions and synthesize
- Moves students' minds to higher cognitive levels
- Used in industry to show shared concepts

Webbing

What is it? A graphic organizer strategy that provides a visual picture of how words or phrases connect to a topic.

How do you use it?

- The teacher lists a topic and builds a web-like structure of words or phrases, etc. that students call out as being connected to a topic. The process applies to most learning situations including content, values, attitudes, and performance activities. The web may be symbols, drawings, color, words, and graphics to depict the topic.

☞ ***Webbing:*** *appropriate at all levels.*

What are the benefits?

- Provides opportunities for the visual learner to "recall" the connections for later use
- Helps students use and share their prior knowledge
- Helps students identify patterns of information
- Used in industry for note taking or diagrams

Concept Mapping

What is it? A graphic organizer strategy that shows relationships among concepts. Usually the concepts are circled and the relationships are shown by connecting lines with short explanations.

How do you use it?

- Select a main idea. The teacher and students identify a set of concepts associated with the main idea. Concepts are ranked in related groups from most general to most specific. Related concepts are connected and the links labeled with verbs or short phrases. The method is very similar to webbing.

☞ ***Concept Mapping:*** *appropriate from third grade through adult.*

What are the benefits?

- Helps students visualize how ideas are connected and how knowledge is organized
- Improves comprehension and problem-solving skills
- Same additional benefits as for webbing

Modular Instruction

What is it? A learner-centered and self-directed learning experience which may be designed for individuals or for small teams. Learning teams that are randomly scheduled so cooperation is required of students who may be from diverse backgrounds or groups. The abilities demonstrated are pre-requisite to success on future jobs.

How do you use it?

- Modular Instruction is usually self-contained and contains the following elements:

✏ Student objectives or expectations

✏ Background information or instructions for research

✏ Student activities or procedures

✏ Application of the objectives to a real life or workplace problem

✏ Assessment of the processes used and products produced through the module

✏ Opportunity for self and team assessment; the instruction may be designed for individual or for small teams

✏ A time frame is usually given as a guide for the module

☞ ***Modular Instruction:*** *appropriate from third grade through adult.*

What are the benefits?

- Improves creative, critical thinking
- Provides practice in use of technology
- Requires practice solving problems, managing time, team work, and trouble shooting
- Provides for a application of academic skills

Technology Learning Activities

What is it? Technology Learning Activities (TLA) is a teacher developed tool which fosters the development of problem solving skills while connecting curricula content with real life scenarios.

How do you use it?

- A real life or real work problem is the basis of the TLA
- A tangible end product is expected upon completion of the TLA
- The teacher's role is facilitation through planning, monitoring, and evaluation
- The students work cooperatively to solve problems through use and management of resources

☞ ***TLA's:*** *appropriate at all levels.*

What are the benefits?

- Teamwork
- Creative thinking
- Problem solving
- Communications
- Applying academic skills
- Student motivation
- Real world applications

Simulations

What is it? A learning process which involves students as participants in role-playing presentations and\or problem solving games imitating real-life situations or workplace environments.

How do you use it?

- Prepare students by reviewing rules
- Supervise closely enough that students stay on task
- Set expectations of performance, time, and, activities to be completed
- Have necessary information and materials organized and available prior to beginning a simulation

☞ ***Simulation:*** *appropriate at all levels.*

What are the benefits?

- Develops decision making skills
- May be developed by a publisher (software, CD, print) or a teacher
- Provides practice for real life or workplace situations and environments
- Allows students to be active in learning
- May involve many SCANS competencies

Demonstrations

What is it? Showing practical applications of theory, product, or equipment; may be performed by teacher, guest, or student.

How do you use it?

- Prepare the class prior to a demonstration
- Set the learning objectives
- Perform or show the practical application of the theory, product, or equipment
- Discuss the actual application
- Have students perform the application
- Discuss any problems that occur

☞ ***Demonstrations:*** *appropriate at all levels.*

What are the benefits?

- Shows how the information or skill is used in the real world
- Creates interest
- Provides opportunity for student involvement when practice time is provided.
- Results in clearer understanding
- Holds interest of student by adding context to learning
- Appeals to several learning styles

Competency Based Education/Performance Based Education

What is it? Instructional programs that are based on industry validated skills, knowledge, and attitudes that have been identified as essential to training for a specific purpose or occupation. (The definition applies to any subject area)

How do you use it?

- Industry knowledge, skills and attitudes required for a job are identified through an occupational analysis
- Skills, attitudes and knowledge required to perform tasks or duties of a job or in an occupation are referred to as competencies
- A competency list is determined for each occupational or cluster job within the cluster
- The competencies are clustered and sequenced by tasks and duties within the occupation
- Students are evaluated on specific competencies within the occupation
- A student competency achievement record is maintained for each student within the program
- Use of pre-assessment on competencies allows students to progress more rapidly through a program

****NOTE**** Performance based instruction and assessment is an extension of competency based instruction. The major difference is the focus on performance of completed skill or task rather than the competencies within it.

☞ ***Competency Based Education***: *appropriate at all levels.*

What are the benefits?

- Specific workplace skills are addressed and assessed
- Workplace relevance is maximized
- Provides a basis for a portable workplace credential based on occupational requirements or proficiency
- May be delivered in individualized manner or through team work
- Sets stage for true performance based assessment in industry
- Allows for self-pacing by student
- Provides remediation opportunities
- Uses many strategies in order to appeal to several learning styles

Individualized Competency Based Programs

What is it? Competency based instruction that is self-paced and designed to meet the needs of individuals with different learning modalities. The curriculum is developed through analysis of the occupation or purpose and based on industry validated skills, knowledge, attitudes, and performance.

How do you use it?

- See Competency Based Education
- An individualized plan and record is kept for each student
- Pre-assessments are used to credit competencies already gained

☞ ***Individualized Competency Based Programs***: *appropriate at all levels.*

What are the benefits?

- See Competency Based Education
- Self-pacing provides student opportunities to speed up progress at their own rate

Individualization Techniques

What is it? Designing learning activities to fit the needs of the individual including one-on-one instruction, tutoring, modifying reading, performance, or writing assignments to increase or decrease the academic level, and providing technology required to adapt instruction for the individual.

How do you use it?

- By assessing the individuals learning styles and academic levels in reading and math, an individualized plan may be developed to assist the student in progressing successfully through a program
- Individualization techniques include a multitude of strategies including individualized education plans, tutoring, computer assisted instruction or learning job coaching, workplace mentoring and others

☞ ***Individualization Techniques***: *appropriate at all levels.*

What are the benefits?

- Increases self esteem
- Relevant to individuals' learning
- Opportunity to progress at own rate
- Personal involvement in the plan and assessment
- Builds self esteem
- Improves learning

Computer Assisted Instruction

What is it? (CAI) Written and visual information presented in a logical sequence to a student through a computer. It is designed to be self-paced and monitor student performance. CAI may be interactive and multi-modal with the use of CD-ROMS and new technology.

How do you use it?

- Prepare learners to operate the equipment and care for it properly
- Use an individualized program which allows students to test and master areas of learning in which they are not proficient
- Develop a scheduling process with goal for learning
- Check on learning progress to assure student understands tasks and uses time well

☞ ***Computer Assisted Instruction***: *appropriate at all levels.*

What are the benefits?

- Allows student to master learning at own pace
- Accommodates many different needs of student learning
- Gives immediate feedback
- Allows teacher time to interact one-on-one
- Improves student motivation

Thematic Unit

What is it? A topic of instruction in which several subject areas collaborate to reinforce the importance of the topic across and within the discipline. The thematic unit is usually related to the real world or workplace. All disciplines may participate in thematic unit if encouraged to think and perform cooperatively and creatively.

How do you use it?

- Teachers agree on the topic for the unit, time frame, how and when it is to be implemented
- Teachers team up to brainstorm how they can work together to implement and support learning across and in their classes
- A number of strategies may be used to implement a thematic unit including technology, teamwork, projects, technology learning activities, cooperative learning, and cooperative projects

☞ ***Thematic Unit**: appropriate*

What are the benefits?

- Relevance to students
- Related assignments allow for credit across disciplines
- Focus on one major topic during a specified time period by all subjects; provides for depth and breadth of learning
- Increases motivation of students
- Provides teamwork opportunities for teachers and students
- Improves quality and connection across all areas of the school

Pre-Apprenticeship Training

What is it? Provides for remediation of basic skills and employability skills in apprenticeship approved programs (usually subsidized learning targeted for at-risk students).

How do you use it?

- Identifies deficiencies in student basic skills and employability skills
- Develop an individualized training plan addressing each deficiency
- Implement the plan using student and most appropriate other resource person in assessing improvement and providing accountability

☞ ***Pre-Apprenticeship**: targets unemployed adult, high school dropouts, incarcerated youths, and ex-offenders.*

What are the benefits?

- Improved student motivation by focusing on individual needs
- Improved networking opportunities
- Provides real applications of goal setting and accountability for student
- Apprentice occupations registered by Department of Labor are usually high skill/high wage occupations

Youth Apprenticeship

What is it? Provides specific technical training and competency attainment that lead to advanced standing and a progressive wage in an occupation approved by the Department of Labor (DOL). Youth Apprenticeship Training is usually offered during the last two years of high school and provides monitored work (preferably paid) experiences which are integrated with classroom study and result in academic and occupational credentials.

How do you use it?

- Classroom study including academic skills use work related examples for learning to be applied in context
- Academic applied technology teachers collaborate to design, implement, assess and improve learning activities
- Academic teachers meet with industry representatives and in the workplace to improve applied strategies
- Students are placed in programs in which they have long term career interest
- Exit with specific technical competencies

☞ ***Youth apprenticeship:*** *targets students from ninth grade through twelfth.*

What are the benefits?

- Student receives advanced standing in an occupation
- Opportunities for wage increasing as skills build in occupation

Apprenticeship Training

What is it? A combination of teachers and workplace mentors work collaboratively to assure work experience and guided learning within an industry or occupation cluster, linkage between secondary and postsecondary education credentials, certification of occupational skills, and both worksite and classroom learning opportunities.

How do you use it?

- Designed to upgrade incumbent workers
- Combine structured OJT training with theoretical instruction
- Sponsored by employers or labor/management groups that have the ability to hire and train in a work content of both OJT and related instruction is dictated by industry
- Receives transferable certificate for progression in the field

☞ ***Apprenticeship Training***: *targets secondary students and adults enrolled in post secondary or community college programs.*

What are the benefits?

- Ticket to move up career ladder in industry
- Equivalent to a baccalaureate degree in the field of building construction, and many manufacturing related industries
- Higher wages tied to high skills
- Higher level psychomotor learning

Adult Apprenticeship

What is it? Provides training for journey level status in high wage occupations registered by the Department of Labor (DOL).

How do you use it?

- Selection and entry is based on interest, aptitude, and a review process
- Technical skills are the focus of the apprenticeship
- A training frequently includes both work-based and classroom or individual based learning

☞ ***Adult Apprenticeship**: targets adults.*

What are the benefits?

- Geared for high wage occupations
- Apprenticeable occupations registered by Department of Labor (DOL)
- Transportable credentials
- Recognized quality training and high level/skills

Guided Workplace-Learning

What is it? Provides students with the opportunity to gain practical, first-hand knowledge in broad occupational clusters or industry sectors through a structured intern experience. This internship is designed to give students an opportunity to integrate occupational and applied academic learning, and to apply knowledge and skills learned in a classroom to actual work situations not generally available through paid employment.

How do you use it?

- Individual selects a major area of interest in the community or workplace; student studies the area of interest
- A plan is developed by the workplace mentor, teachers, students, and parents that outlines the workplace learning experiences
- The student, workplace mentor, and teacher develop a plan to monitor and improve workplace learning for the student
- The student usually completes the learning by developing a portfolio or product as a result of the guided workplace learning experiences
- Students may be required to apply and document academic skills throughout the experience
- Usually unpaid

☞ ***Guided Workplace-Learning**: appropriate from middle school through adult.*

What are the benefits?

- Student focused and centered
- Learning opportunities for exposure to variety of workplace levels within a career field
- Provides excellent working opportunities
- Allows students to connect school and work in context of workplace

Internship

What is it? May be paid or unpaid workplace experience in roles that sometimes are more responsible than individuals would have as cooperative on-the-job-training (OJT) students. If internship is unpaid, strict rules governing the training plan, activities, and length of time must be followed.

How do you use it?

- Individual selects a major area of career interest
- Curriculum choices are made to support the career area
- Cooperative training plan is designed by the training sponsor, teacher, coordinator, and the student
- Typically the student begins by observing and progresses through assisting to workplace skills required in the occupation or profession
- The student should be able to demonstrate acceptable technical and employability skills in the internship
- Internship may be unpaid
- Student progresses through a variety of skills requiring increasingly higher levels of knowledge
- Students should be exposed to the broad aspects of the industry
- The student may keep a journal of workplace learning
- An industry trained teacher or coordinator is expected to assist the student and coordinate the training regularly with the workplace mentor or supervisor

☞ ***Internship:*** *appropriate at secondary and post secondary levels.*

What are the benefits?

- Provides broad exposure to an industry
- Allows student to see and experience job requirements at many levels
- Provides excellent networking opportunities
- Provides real exposure related to the occupation
- May involve higher level opportunities than available in other formats for workplace learning

Externship

What is it? A program designed to partner community leaders with students. The purpose of the externship is to provide realistic learning and leadership opportunities related to careers and roles of workers within an organization. Externship is usually tied to a specific project for a semester or less.

How do you use it?

- Students are matched with community leaders based on interest or goal of the externship
- A written plan is developed outlining expectations of learning and experiences signed by the student, community leaders, schools, coordinator and often the parent
- The student becomes a part of a team solving a work based or community problem or working on a project
- Students should be exposed to all aspects of the work based problem or project
- Externships should be followed up by a school coordinator or representative
- Externships are not designed to be "unpaid on-the-job" programs but higher level workbased or community based project experiences
- Student should keep a learning experience log, be required to reflect on the experience, and produce a comprehensive report on the externship after it is completed.

☞ ***Externship***: *appropriate at secondary and post secondary levels.*

What is are the benefits?

- Provides experience in working through actual work-based problems
- Provides the same type of benefits as the internship but may be tied to a community interest of the student or a job
- Provides strong leadership models in action
- Provides experience in solving community problems

Career (Job) Shadowing

What is it? An activity that enables young people to observe adults in work settings, learn the requirements of various jobs, and experience the flow of a typical workday

How do you use it?

- Student teamed with an individual in the workplace
- Student observes the typical workday, including all assigned tasks
- Student reports on learning and experience that occurs
- Career shadowing is usually short-term
- Student may be asked to reflect on experiences and relate to personal interests

☞ ***Career (Job)Shadowing:*** *appropriate from Kindergarten through adult.*

What are the benefits?

- Exposure to real work place
- Gives student first hand look at real life in that occupation
- Provides concrete personal experiences on which to later make career decisions
- Short term experience allows for more opportunity to observe workplaces
- Helps student broaden view of workplace
- Assists in networking with others

Career/Workplace Mentors

What is it? A one-on-one process using business, community, or industry representatives to interact with a student or a teacher as a guide or counselor in matters related to their education or future job choices.

How do you use it?

- Student teamed with a workplace mentor
- Mentor provides role model in the workplace
- Mentor counsels with students or teacher regarding careers and education
- Mentor provides exposure to the workplace through visits, projects, or other means

☞ ***Career/Workplace Mentors**: appropriate from middle school through adult*

What are the benefits?

- Networking for future employment
- Opportunity to learn more about the workplace than career shadowing affords
- Positive role model influence
- Career guidance from an individual who knows what training, work skills, and education is needed in that field

Project-Based Learning

What is it? Any individually or team designed learning activity that has a culminating product, service, or demonstration related to real life or workplace application and is to be accomplished in a specified length of time.

How do you use it?

- Project learning is designed to include both product and process
- The project and expectation is usually described in an information sheet
- The project may require the student to complete research using a variety of resources
- The students are frequently involved in creating a product, communication with others, and presenting the project in a formal manner
- Students are required to assess the product and processes
- Outside evaluators from the community or other classes may be involved in evaluation

☞ ***Project based Learning:** appropriate from kindergarten through adult.*

What are the benefits?

- Critical thinking skills improved
- Creativity enhanced
- Self-esteem built
- Communication improved
- Ability to see in the minds eye
- Leadership skills improved
- Technical skills required
- Technology used

School Based Enterprises

What is it? (School Sponsored Enterprises) *An activity that engages students in providing services or producing goods for sale or use to people other than the participating students.* Individual or sequenced courses are setup to provide skills needed for entrepreneurship through student run businesses.

How do you use it?

- Students learn how to operate a business
- Students practice all steps and roles in the enterprise under close supervision of teachers and business representatives
- Students understand first hand success or failure in an enterprise
- Opportunity to analyze situation and apply quality tools and steps to improve
- Requires in-depth application learning aspects of the industry
- Opportunities unlimited
- Applies most academic areas to the enterprise

☞ ***School Based Enterprises*** : *appropriate from elementary through adult.*

What are the benefits?

- Increase decision making skills
- Workplace skills
- Practice real workplace roles
- Appreciate need for skills
- Increase understanding of profit and loss
- Learning contextual in nature

Student or Senior Capstone Project Activity

What is it? A major self-directed project of specific interest to the student which involves major improvement of workplace skills for participating students. (Individual or sequenced courses are set up to provide skills needed for entrepreneurship through student run businesses.

How do you use?

- Similar to project based learning except the student usually designs a project or capstone experience proposal based on the student's interest and goals, and presents it to a team of advisors including teachers, businesses and industry representatives prior to completing the project experience
- The project activities are coordinated by the student and advisory team networking throughout the community
- Upon completion of the project or experience the student is usually required to make a presentation to the school or school board and the community through a chamber of commerce or other appropriate meeting
- Capstone experiences and senior projects usually do not exceed one semester in length
- Both processes used and products of the experience or project are evaluated by the team of advisors

☞ ***Student or Senior Capstone Project Activity***: *appropriate at ending grade in each level of education.*

What are the benefits?

- Allows students to focus study in a high interest career on community service area
- Provides opportunity to increase workplace skills
- Provides opportunity to improve communication skills
- Applies all academic skills in context through the activity
- Requires student to demonstrate goal setting, time and resource management, networking, troubleshooting, higher level thinking and leadership development
- Usually requires a formal presentation of learning through some type of portfolio document to a group including community representatives

Clinical Experience or Clinical Practicum

What is it? Provides training and experience in the actual work setting which usually requires licensure. Direct supervision by a faculty member of the program with expertise and experience in the occupation being pursued is required. The terms Clinical Experience or Clinical Program are usually used with health and medical related programs.

How do you use it?

- Teacher is usually a licensed health care professional in the field of the clinical experience
- The teacher coordinates training and student assisting in appropriate hospital or clinic based tasks
- A training plan which details tasks and duties of the student is developed for each workplace and student
- Students are evaluated by both the classroom instructor and the professionals in the workplace

☞ ***Clinical Experience or Clinical Practicum***:
appropriate at secondary and post secondary levels.

What are the benefits?

- Actual experience in the workplace
- Improved skills in real setting
- Real problem solving opportunities
- Higher level thinking and performance required
- Emphasizes the importance of work ethics and quality job performance
- True learning in context
- Provides opportunities to apply academic skills in the workplace
- Close supervision identifies areas of needed remediation

Occupational Field/Field Practicum

What is it? Same definition as for clinical experience or field practicum (The terms occupational field experience or field practicum may be used in any career cluster area of study requiring licensure.)

How do you use it?

- Student learns practical skills in the classroom
- Student observes the skill in the work setting being demonstrated by professionals in the field
- Student assists with the skills in the field with direct supervision
- Student may demonstrate the skills in work setting with direct supervision of a professional, or industry qualified instructor for that field

☞ ***Occupational Field/Field Practicum***:
appropriate at secondary and post secondary levels.

What are the benefits?

- Applied learning in the workplace
- First hand practice of skills required on the job
- Supervision reduces errors
- Opportunity to assess personal success in the field
- Skills assessment mandatory
- Requires higher level thinking and problem solving skills
- Provides opportunities to apply academics in context of the workplace

Service Learning

What is it? A form of experiential education in which participants gain and apply knowledge and skills as they seek to meet real community needs. Service learning differs from conventional community service or volunteerism by incorporating structured reflection and links to the academic curriculum. It emphasizes concrete outcomes both for learners and for the community.

How do you use it?

- Students select a project of importance to the community or school and of interest to the student
- Depending on the project, student may volunteer hours after school in the service activity or use a portion of school time to participate in the project
- Service learning may be done by an individual, class, or small group
- Service learning usually results in a contribution of time, effort, and or resources by the student to help someone or something in the community
- Assessment of service learning provides for product, process, and reflective assessment
- Students' efforts usually are presented in the form of a written and oral report in the community

☞ ***Service Learning***: *appropriate at all levels.*

What are the benefits?

- Student becomes involved in providing service to the community
- Develops good citizenship skills
- Builds self-esteem
- Provides leadership training
- Builds responsibility and work ethic

Supported Employment

What is it? Is used for placing individual with significant disabilities in paid employment positions. Job coaches assist in training throughout the transition and skill learning phase of employment by providing ongoing support.

How do you use it?

- Place and train model for individuals with significant handicaps
- Develop training plan for individual including employability and job specific skills

☞ ***Supported Employment***: *appropriate from secondary through adult.*

What are the benefits?

- Designed for individuals with significant disabilities
- Involves one-on-one training and job coach skills
- Paid employment for the student while initially employed
- Intensive on going support
- Builds self-esteem

Federally Sponsored Employment Training Program

What is it? used for assisting targeted unemployed groups with comprehensive services to help get individuals trained or retrained and placed back into satisfying employment in the workplace.

How do you use it?

- Place and train model for targeted unemployed groups
- May provide education for retraining of groups displaced by technical changes or industry downsizing
- Provides employment assistance and training through employee acceptance in the workplace
- Involves one-to-one job coach and ongoing support
- Paid employment in community based jobs

☞ **Federally Sponsored Employment Training:** *appropriate for adults.*

What are the benefits?

- Retraining improves self-esteem
- Job placement provides financial stability
- Assists hard to place unemployed
- Helps break poverty cycle

Cooperative On-the-Job-Training

What is it? Combines classroom instruction with work experience and on-the-job training related to the student's career goals. The student receives pay for the work and course credit; a training plan signed by the parent, employer, school coordinator, and student is required.

How do you use it?

- The teacher matches student career goal with related jobs for potential work experiences
- Students interview for jobs and are selected by the employer
- Teacher, employer, and student develop and sign a training agreement and training plan outlining in writing the duties and learning expected on the job, the wages, and the approximate hours per week the student will work
- The employer supervises and counsels student on the job
- The teacher/coordinator manages classroom instruction and visits the student and employer on the site each grading period
- The student keeps a time sheet record and record of training
- The evaluation form and training plan is updated each grading period to reflect student's progress and changes in career objective
- Both the employer and teacher evaluate the OJT
- The vocational student organization (VSO) serves as the students' support organization. Through the VSO the student may demonstrate workplace competency in career related performance events held at local, district, state, national and international levels of competition.

☞ ***Cooperative On-The-Job-Training***:
appropriate for secondary, post secondary and adults.

What are the benefits?

- Used in business and industry to assess employee progress
- Provides paid experience
- Develops workplace skills progressively
- Reinforces and enhances classroom instruction
- Provides opportunities for career growth and development

Interviews

What is it? A strategy for person to person gathering of information through questions and reporting the results of the session.

How do you use it?

- Students pre-plan a set of questions, a format for the interview, and a presentation
- Interviews are usually tape recorded or videoed if acceptable to the person being interviewed
- Students should practice the interview prior to the actual interview
- Students should select the person, and make an appointment for the interview
- Conduct the interview and write the report
- Students should follow up with a thank you letter (possibly a report)

☞ ***Interviews***: *appropriate for all levels.*

What are the benefits?

- Fosters connections
- Develops ability to interpret answers
- Improves organizational and planning skills
- Develops problem-solving skills
- Used in many industries for multiple purposes

Journals

What is it? A strategy which uses writing in a dialogue format as a way for students and the teacher to communicate regularly and carry on a private conversation.

How do you use it?

- Students write on assigned topics on a regular basis, and the teacher responds with advice, comments, observations, thus serving as a participant, not an evaluator, in a written conversation. In the early stages of learning to write a language, students can begin by writing a few words and combining them with pictures. This may be used to process teamwork or individual projects.

☞ ***Journals:*** *appropriate from elementary through adult.*

What are the benefits?

- Develops communication and writing skills
- Creates a positive relationship between the teacher and the student
- Increases student interest and participation
- Allows for student to direct his/her own learning
- Provides continuous feedback from the teacher
- Used in some industries to annotate information needed by a following shift worker

Continuum

What is it? A strategy used to indicate relationships of words and phrases.

How do you use it?

- Using a selected topic, students place words/phrases on the continuum to indicate a relationship of degree, e.g., below industry, marginal industry, meets industry standards, exceeds industry standards.

☞ ***Continuum***: *appropriate from middle school through adult.*

What are the benefits?

- Acknowledges that others have different perspectives depending on their knowledge and experience regarding the topic
- Develops ability to use precise vocabulary
- Improves critical thinking

Learning Log

What is it? A strategy to develop structured writing. It is also a strategy that is useful in identifying workplace related learning experienced by another student at any level above second grade. An excellent follow-up to Knows-Wants-Learns (K-W-L).

How do you use it?

- Student develops a list by date of what they have learned
- Log may be used for a project, subject, or task
- A checklist may be used to develop the log

☞ ***Learning Log***: *appropriate form third grade through adult.*

What are the benefits?

- Student responsibility
- Student uses critical thinking skills
- Demonstrates personal accountability for learning something new

Exhibits

What is it? A strategy for creating a focused visual display.

How do you use it?

- Students work in groups to create exhibits representing a workplace, a career, a theme, or technology applications to an industry

☞ ***Exhibits***: *appropriate from kindergarten through adult.*

What are the benefits?

- Develops critical thinking
- Highlights ability to select important high points
- Encourages creativity and individuality
- Strengthens problem-solving skills
- Requires research and resource management

Models

What is it? A simplified representation of a concept. It may be concrete, such as a balsa wood model of a bridge, cut away of an automobile transmission, or abstract like a model of weather systems. May also be used to describe visual or graphics, organizers used in presenting ideas through total quality, continuous improvement and other business systems.

How do you use it?

- Students create a concrete product that represents an abstract idea or a simplified representation of an abstract idea

☞ ***Models**: appropriate from kindergarten through adult.*

What are the benefits?

- Engages the tactile and visual learners in an appropriate activity for their learning style
- Facilitates understanding of conceptual ideas
- Connects real world and academics visually
- Usually easy to understand

The Learning Cycle

What is it? A sequence of lessons designed to have students engage in exploratory investigations, construct meaning out of their findings, propose tentative explanations and solutions, and relate concepts to their own lives.

- **How do you use it?**
- Engage the learner with an event or question to draw their interest, evoke what they know and connect that with new ideas
- Explore the concept, behavior, or skill with hands-on experiences
- Explain the concept, behavior, or skill and define the terms. Students use the terms to explain their exploration.
- Through discussion, expand the concept or behavior by applying it to other situations

☞ ***The Learning Cycle:** appropriate from kindergarten through adult.*

What are the benefits?

- Encourages students to construct their own understanding of concepts
- Provides hands-on experiences to explore concepts, behaviors, and skills
- Develops ability to share ideas, thoughts, and feelings
- Improves higher level thinking skills
- Improves academic skills and connections to real world

Problem Solving

What is it? A learning strategy in which students apply knowledge to solve problems. This approach facilitates scientific thinking.

How do you use it?

- Discover a problem; problems can be real-world problems suggested by business, industry, the community, students, or the teacher
- Define the problem; ask a question about the problem
- Define the characteristics of possible solutions
- Research the solutions, including scientific observation and experimentation, library research, calculations, model building, etc
- Choose a promising solution that best fits the criteria stated in the definition of solutions
- Test the solution
- Determine if the problem has been solved

☞ ***Problem Solving***: *appropriate from kindergarten through adult.*

What are the benefits?

- Allows students to discover relationships that may be completely new to them
- Adapts easily for all grade levels and special needs students
- Develops ability to construct new ideas and concepts from previously-learned information, skills, and strategies
- Develops critical thinking skills
- Develops good employment skills
- Provides academic skill application to real life situations

Predict, Observe, Explain

What is it? A strategy in which the teacher shows the class a situation and asks them to predict what will happen when a change is made.

How do you use it?

- Show students a situation and ask them to predict what will happen when some change is made
- Students observe what happens when the change is made
- Then, discuss differences between their predictions and the results
- Students explain what happened through a variety of technology

☞ ***Predict, Observe, Explain***: *appropriate from kindergarten through adult.*

What are the benefits?

- Helps students understand science concepts
- Encourages higher-level thinking
- Requires students to use complex thinking skills
- Improves problem solving ability
- Improves communication skills
- Improves technical skills
- Requires application of academic skills and technology to the situation

Reflective Thinking

What is it? Considering or thinking about what was learned after a lesson is finished, usually by writing what was learned.

How do you use it?

- Two possible approaches to reflective thinking are:
- Students can write in a journal the concept learned, comments on the learning process, questions or unclear areas, and interest in further exploration, all in the students' own words
- Students can fill out a questionnaire addressing such questions as: Why did you study this? Can you relate it to real life?

☞ ***Reflective Thinking***: *appropriate from third grade through adult.*

What are the benefits?

- Helps students assimilate what they have learned
- Helps connect concepts to make ideas more meaningful
- Improves writing and thinking abilities
- Connects the lesson to life and work

Cooperative Learning

What is it? A strategy in which students work together in small intellectually and culturally mixed groups to achieve a common goal. The outcome of their work reflects how well the group functioned.

How do you use it?

- After organizing students into groups, the teacher thoroughly explains a task to be accomplished within a time frame
- The teacher facilitates the selection of individual roles within the group and monitors the groups, intervening only when necessary, to support students working together successfully and accomplishing the task

☞ ***Cooperative Learning***: *appropriate all levels.*

What are the benefits?

- Fosters interdependence and pursuit of mutual goals, joint rewards, face-to-face interaction
- Develops communication/leadership skills
- Increases the participation of shyer students
- Produces higher levels of student achievement and self-esteem
- Fosters respect for diverse abilities and cultural backgrounds
- Teaches teamwork

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Specific Cooperative Learning Strategies (continued)

Jigsawing

What is it? A cooperative learning strategy in which everyone becomes an "expert" and shares his or her learning so that eventually all group members know the content.

How do you use it?

- Students are divided into groups; each group member is assigned a numbered section or a part of the material being studied
- Each student meets with the students from other groups who have the same numbered section
- This new group learns together, becomes an expert on their material, and then plans how to teach the material to members of their original groups
- Students return to their original groups and teach their area of expertise to the other group members

☞ ***Jigsawing***: *appropriate elementary through adult.*

What are the benefits?

- Builds depth of knowledge
- Solidifies a student's own understanding and misunderstanding
- Learning one concept well builds on another
- Develops cooperative working skills and team building
- Develops leadership
- Improved communication skills

Corners

What is it? A cooperative learning strategy for learning a task and sharing that learning.

How do you use it?

- The teacher assigns small groups of students to different corners of the room
- Groups discuss various solutions and points of view concerning an issue
- Corner teams share conclusions, practice communication skills, and decide presentation format
- Small groups present to the class.

☞ ***Corners***: *appropriate all levels.*

What are the benefits?

- Elicits points of view
- Builds communication skills, especially listening and taking turns
- Allows opportunities for shyer students to function positively in small groups

Think, Pair and Share

What is it? A cooperative learning strategy for helping students develop their own ideas and build on ideas of co-learners.

How do you use it?

- Students reflect on a topic and form pairs to discuss, review, and revise their ideas to share with class

☞ ***Think, Pair and Share***: *appropriate from kindergarten through adult.*

What are the benefits?

- Helps develop conceptual understanding of a topic
- Develops ability to filter information and draw one's own conclusions
- Develops ability to consider other points of view

Debate

What is it? A cooperative learning strategy in which students organize planned presentations on various viewpoints.

How do you use it?

- Students form teams to research, develop, and articulate their viewpoints
- Students follow guidelines for presenting their viewpoints
- Each team has the opportunity to challenge the other teams' key points in an organized manner
- Debate team then summarize their point
- A panel or team decides on which team wins the debate based on rubrics designed for the debate

☞ ***Debate:*** *appropriate elementary through adult.*

What are the benefits?

- Develops ability to organize information
- Develops ability to filter ideas and draw conclusions
- Provides opportunities for students to practice articulating their own ideas and build a persuasive argument
- Provides opportunities to argue issues in an appropriate manner
- Provides opportunity to practice for future roles

Brainstorming

What is it? A strategy for eliciting ideas from the group.

How do you use it?

- Students contribute ideas related to a topic or problem-centered topic
- All contributions are accepted without initial comment
- After the list is finalized, students categorize, prioritize, and defend selections

☞ ***Brainstorming:*** *appropriate all levels.*

What are the benefits?

- Reveals background information and knowledge
- Discloses misconceptions
- Helps students relate existing knowledge to content
- Strengthens listening skills
- Creative thinking
- Conceptual thinking
- Problem solving
- Low stress
- Non-judgmental
- Improves communication both speaking and listening skills

Field Experience

What is it? A planned learning experience in the community for students to observe, study, and participate in a real-life setting, using the community as a laboratory.

How do you use it?

- Teachers and students plan and structure the experience by preparing before hand for activities
- During the visit and learning, goals are firmly established
- Student expectations are written and documented after the trip in an authentic manner
- Students participate in questioning, listening, and doing specific things during the field experience
- After the field experience, students and teachers engage in follow-up activities including showing appreciation for the experience

☞ ***Field Experience:*** *appropriate all levels.*

What are the benefits?

- Develops organizational planning skills
- Focuses on observation skills
- Assesses students in meeting goals
- Gives students a real-world experience
- Provides active learning opportunities
- Connects real world to classroom

K-W-L (Knows-Wants-Learned)

What is it? An introductory strategy that provides structure for recalling what the student knows regarding a topic, noting what the student wants to know, and finally listing what has been learned and is yet to be learned.

How do you use it?

- List all information students know or think they know under "What We Know"
- List "What We Want to Know," categorizing the information the students expect to use
- Once they have read and/or done the research, they confirm what was listed as true or not, compare with what was predicted, and summarize what was confirmed by the text
- Students read an article, they compare and confirm what they found to be true in the article with what they thought they knew
- Finally, students list "What We Still Need to Learn" and work in cooperative groups to decide what the resources are, divide the responsibilities, and decide on the presentation format

☞ ***Knows-Wants-Learned****: appropriate at all levels.*

What are the benefits?

- Builds on prior knowledge
- Develops predicting skills
- Provides structure for learning
- Improves research skills, e.g., reading for specific technical information
- Develops communication skills in cooperative groups
- Strengthens teamwork skills

APPENDIX 4B

English as a Second Language (ESOL)
Teaching Strategies for All Students

The appendix is divided into three sections including:
Beginning ESOL Characteristics/Strategies
Intermediate ESOL Characteristics/Strategies
Advanced ESOL Characteristics/Strategies

The list is not designed to be all inclusive, it is designed to assist teachers and students in knowing how to recognize characteristics of students and strategies for improving learning in the classroom. The strategies are taken from "best practices" cited across the literature related to ESOL students' increase in academic performance. The strategies are also found to be effective with students with varying learning styles.

Appendix 4B

Beginning ESOL Student Characteristics	Teacher Strategies
◆ remain silent; silence is a stage of language learning.	◆ wait for students to take the time to understand and translate what they have to say;
◆ depend on body language, gestures, (words or phrases such as "huh?", "unh-unh," and "uh-oh."); consistent in structure, use of gestures, para-language and body language;	◆ remember ESOL students are not deaf;
◆ be actively listening as they silently translate;	◆ show patience, encourage;
◆ misinterpret body language or gestures, (a teacher motioning for a student to move toward her or him by using the forefinger may be a demeaning gesture in certain cultures);	◆ empathy, support, acceptance;
◆ have limited school experience;	◆ provide for students to hear and practice language in context with others;
◆ exhibit extremes of behavior: frustration, nervousness, fear, and self-consciousness.	◆ allow students to listen to other students, other teachers, and community people;
	◆ provide a learning buddy/mentor; peer support builds much-needed friendships and understanding beyond academic areas;
	◆ involve business and industry partners, support persons, and community members;
	◆ use categorizing, this provides "hooks" for learning;
	◆ use visual aids; label classroom items; match words with pictures, items, colors, and symbols;
	◆ provide opportunities for ESOL students to learn and respond to classroom directions;
	◆ use repetition and consistency in instructions and gestures.

Intermediate ESOL Student Characteristics	Teacher Strategies
◆ Unsystematic and random language errors may lead to misunderstanding. ◆ Exhibit social language skills that exceed language abilities necessary for academic and workplace success. ◆ May have difficulty reading and writing appropriately or are able to read and write in English, yet may have difficulty speaking. ◆ Exhibit limited but continuing progress in vocabulary, control of sentence structure, ability to read, write, and speak in English ◆ Asks and answer questions without being able to expand or explain. ◆ Require an extended period of time to process information.	◆ Correction should occur within the area of teaching. ◆ Continually provide opportunities to expand vocabulary and use vocabulary in the contexts of work. ◆ Provide opportunities for ESOL students to learn how to ask and answer questions beyond "yes" or "no" answers. ◆ Do not interrupting a student who is still in a translation stage or groping for vocabulary. ◆ Learn to wait in silence with an encouraging look. ◆ Set reachable goals and expect students to be accountable. ◆ Encourage students to ask questions to clarify their understanding. ◆ Obtain background information about language and culture to avoid embarrassing situations. ◆ Speak clearly and at a normal pace with normal stress and intonation. ◆ Check for understanding. ◆ Present key words and technical terms orally, and with the use of visual aids before introducing new concepts or procedures. ◆ Use real work objects, training aids, displays, technical reports, or self-improvement reports.

Advanced ESOL Student Characteristics	Teacher Strategies
◆ Begin to apply reading and writing skills to acquire information in academic areas and in real-life situations. ◆ Choose to use more than one language to communicate. ◆ Exhibit oral fluency but still lack higher-level, specific language and writing skills. ◆ Make inaccurate inferences from cultural, linguistic, and intellectual experiences.	◆ Learn to rephrase what the student has said in a correct model and focus on the use of English. ◆ Provide examples of assignments for technical reports, real work estimates, team reports, self-improvement reports, lab reports, and research assignments. ◆ Use cooperative learning groups. ◆ Ask students to explain what they have heard or read and where they have seen words, phrases, or situations.

APPENDIX 4C

Strategies for At-Risk Students to Improve Learning

The handout is designed to provide a "laundry list" of ideas to improve students' learning and motivation. It is not meant to be all inclusive.

Appendix 4C

Teachers can raise the level of student motivation and teach persistence by constantly modeling interest in the subject, tasks, and connected assignments. Ideas for tapping into at-risk student's own intrinsic levels of motivation and setting up successful strategies for improving learning, are:

- use active learning situations such as work-based learning activities, role-playing, simulations, real work projects, group work, discussions, experiments, and creative individual work;
- use demonstrations: work based situations, role playing, human relations problems, and management decision making;
- use competency based-individualized learning, computer-assisted-learning, and modular performance activities;
- reduce abstraction: make instructions as concrete as possible;
- load instruction with lots of examples, stories, and demonstrations;
- use physical objects, pictures, models, maps, cut-a-ways diagrams, and colors;
- provide short tasks and assignments to give the at-risk student a sense of accomplishment;
- offer limited choices of homework, large projects, or long assignments;
- have students compare their current efforts to their previous work;
- compare student performance to a standard NOT other students;
- avoid posting or calling out grades;
- avoid individual competition in class, use team competitions carefully designed so that the at-risk student is likely to succeed;

- use puzzles, brain teasers, and games to master facts and figures;
- help students to concentrate on the task completion and success;
- help students evaluate unsuccessful attempts;
- develop improvement strategies;
- teach test taking skills, give pre-tests and post-tests to show improvement, treat tests as opportunities for assessment of learning NOT as measures of ability, use more than one method for assessment;
- provide advance structure by providing study guides, and outlines, teach note-taking and outlining skills;
- provide immediate feedback on student work, circulate around the classroom and monitor student's efforts on the spot, promptly return homework, assignments, and exams.

The Dropout Prevention Act of 1986, Section 230.2316, *Florida Statutes*, was enacted to authorize and encourage school boards to establish Dropout Prevention Programs. These programs are designed to meet the needs of students who are not effectively served by traditional programs in the public school system. They include students who are unmotivated, unsuccessful, truant, pregnant and/or parenting, substance abusers, disruptive, and adjudicated.

Strategies used in these dropout prevention programs that have been found to be effective are proving successful in more traditional settings. They include:

- competency-based curriculum which allows students to work at their own pace;
- career awareness and on-the-job training for employability skills;
- instructional strategies that include cooperative learning, computer-assisted instruction, multiple intelligences, authentic/alternative assessment, critical thinking, and graphic organizers;

- flexible scheduling or use of time; students "declare" a schedule and attend even though it may be beyond the traditional school day; competency-based curriculum delivered through computer-assisted instruction;
- experiential learning and hands-on activities;
- mentoring and nurturing.

APPENDIX 5A

Applied Technology - Sunshine State Standards' Connections

The appendix provides teacher validated curricular integration and transdisciplinary connections across the "Applied Technology Standards" (all aspects of the industry) developmental framework and the "Sunshine State Standards".

The matrix provides a two dimensional picture of connections across standards and disciplines. A multidimensional model of connections can be expanded by further connecting the disciplines within the curriculum. The expansion of the two-dimensional model will be developed in a toolbox for teachers.

Following on Pages 237--245 is the Matrix with Mathematics

ACADEMIC-APPLIED TECHNOLOGY CONNECTIONS					
DISCIPLINE	**Math**				
Applied Technology	**A. Number Sense, Concepts and Operations**				
	1. The student understands the different ways numbers are represented and used in the real world.	2. The student demonstrates an understanding of number systems.	3. The student understands the effects of operations on numbers and the relationships among these operations, selects appropriate operations, and computes for problem solving.	4. The student uses estimation in problem solving and computation.	5. The student understands and applies theories related to numbers.
A. Planning					
1. Applies planning methods to decision-making related to life and work roles.	■	■	■	■	■
B. Management					
1 Employs management techniques to manage projects and enterprises related to work and life roles.	■	■	■	■	■
2. Applies marketing and promotional techniques to products and services in a business or social setting.	■			■	
3. Demonstrates knowledge and abilities necessary as a contract employee or to initiate and maintain a service or product based business.	■	■	■	■	■
C. Finance					
1. Demonstrates financial planning ability and decision-making related to work and life roles	■	■	■	■	■
D. Technical and Production Skills in the Work Place					
1. Organizes work assignments by demonstrating production techniques.	■	■	■	■	■

ACADEMIC-APPLIED TECHNOLOGY CONNECTIONS

DISCIPLINE	Math				
Applied Technology	**A. Number Sense, Concepts and Operations**				
	1. The student understands the different ways numbers are represented and used in the real world.	2. The student demonstrates an understanding of number systems.	3. The student understands the effects of operations on numbers and the relationships among these operations, selects appropriate operations, and computes for problem solving.	4. The student uses estimation in problem solving and computation.	5. The student understands and applies theories related to numbers.
E. Technology					
1. Demonstrates use of applied technology to perform academic tasks.	■	■	■	■	■
2. Applies appropriate technology to an industry to solve technical and production problems	■	■	■	■	■
F. Labor					
1. Demonstrates an understanding of labor issues related to the work place.	■	■	■	■	■
G. Community Issues					
1. Analyzes and communicates the impact that industry and the community have on each other and on the individual.	■	■	■	■	■
H. Health, Safety, and Environment					
1. Analyzes and communicates health and safety issues in the workplace.	■	■	■	■	■
I. Personal Conduct					
1. Demonstrates an understanding of professional conduct in personal roles, as well as in work and industry.	■	■	■	■	■

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ACADEMIC-APPLIED TECHNOLOGY CONNECTIONS				
DISCIPLINE	**Math**			
Applied Technology	**B. Measurement**			
	1. The student measures quantities in the real-world and uses the measures to solve problems.	2. The student compares, contrasts, and converts within systems of measurement (both standard/nonstandard and metric/customary).	3. The student estimates measurements in real-world problem situations.	4. The student selects and uses appropriate units and instruments for measurement to achieve the degree of precision and accuracy required in real-world situations.
A. Planning				
1. Applies planning methods to decision-making related to life and work roles.	■	■	■	■
B. Management				
1 Employs management techniques to manage projects and enterprises related to work and life roles.	■	■	■	■
2. Applies marketing and promotional techniques to products and services in a business or social setting.	■	■	■	■
3. Demonstrates knowledge and abilities necessary as a contract employee or to initiate and maintain a service or product based business.	■	■	■	■
C. Finance				
1. Demonstrates financial planning ability and decision-making related to work and life roles	■	■	■	■
D. Technical and Production Skills in the Work Place				
1. Organizes work assignments by demonstrating production techniques.	■	■	■	■

ACADEMIC-APPLIED TECHNOLOGY CONNECTIONS

DISCIPLINE	Math			
Applied Technology	B. **Measurement**			
	1. The student measures quantities in the real-world and uses the measures to solve problems.	2. The student compares, contrasts, and converts within systems of measurement (both standard/nonstandard and metric/customary).	3. The student estimates measurements in real-world problem situations.	4. The student selects and uses appropriate units and instruments for measurement to achieve the degree of precision and accuracy required in real-world situations.
E. **Technology**				
1. Demonstrates use of applied technology to perform academic tasks.	■	■	■	■
2. Applies appropriate technology to an industry to solve technical and production problems	■	■	■	■
F. **Labor**				
1. Demonstrates an understanding of labor issues related to the work place.	■	■	■	■
G. **Community Issues**				
1. Analyzes and communicates the impact that industry and the community have on each other and on the individual.	■	■	■	■
H. **Health, Safety, and Environment**				
1. Analyzes and communicates health and safety issues in the workplace.	■	■	■	■
I. **Personal Conduct**				
1. Demonstrates an understanding of professional conduct in personal roles, as well as in work and industry.	■	■	■	■

ACADEMIC-APPLIED TECHNOLOGY CONNECTIONS					
DISCIPLINE	**Math**				
Applied Technology	**C. Geometry and Spatial Sense**			**D. Algebraic Thinking**	
	1. The student describes, draws, identifies, analyzes two- and three-dimensional shapes.	2. The student visualizes and illustrates ways in which shapes can be combined, subdivided and changed.	3. The student uses coordinate geometry to locate objects in both two and three dimensions and to describe objects algebraically.	1. The student describes, analyzes and generalizes a wide variety of patterns, relations and functions.	2. Uses expressions, equations, inequalities, graphs and formulas to represent and interpret situations.
A. Planning					
1. Applies planning methods to decision-making related to life and work roles.	■	■	■	■	■
B. Management					
1 Employs management techniques to manage projects and enterprises related to work and life roles.	■	■		■	■
2. Applies marketing and promotional techniques to products and services in a business or social setting.	■	■		■	■
3. Demonstrates knowledge and abilities necessary as a contract employee or to initiate and maintain a service or product based business.	■	■		■	■
C. Finance					
1. Demonstrates financial planning ability and decision-making related to work and life roles	■	■		■	■
D. Technical and Production Skills in the Work Place					
1. Organizes work assignments by demonstrating production techniques.	■	■		■	■

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ACADEMIC-APPLIED TECHNOLOGY CONNECTIONS

DISCIPLINE	Math				
Applied Technology	**C. Geometry and Spatial Sense**			**D. Algebraic Thinking**	
	1. The student describes, draws, identifies, analyzes two- and three-dimensional shapes.	2. The student visualizes and illustrates ways in which shapes can be combined, subdivided and changed.	3. The student uses coordinate geometry to locate objects in both two and three dimensions and to describe objects algebraically.	1. The student describes, analyzes and generalizes a wide variety of patterns, relations and functions.	2. Uses expressions, equations, inequalities, graphs and formulas to represent and interpret situations.
E. Technology					
1. Demonstrates use of applied technology to perform academic tasks.	■	■			
2. Applies appropriate technology to an industry to solve technical and production problems	■	■		■	■
F. Labor					
1. Demonstrates an understanding of labor issues related to the work place.	■	■		■	
G. Community Issues					
1. Analyzes and communicates the impact that industry and the community have on each other and on the individual.	■	■			
H. Health, Safety, and Environment					
1. Analyzes and communicates health and safety issues in the workplace.	■	■			
I. Personal Conduct					
1. Demonstrates an understanding of professional conduct in personal roles, as well as in work and industry.	■	■			

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ACADEMIC-APPLIED TECHNOLOGY CONNECTIONS			
DISCIPLINE	**Math**		
Applied Technology	**A. Data Analysis and Probability**		
	1. The student understands and uses the tools of data analysis for managing information.	2. The student identifies patterns and makes predictions from an orderly display of data using concepts of probability and statistics.	3. The student uses statistical methods to make inferences and valid arguments about real-world situations.
A. Planning			
1. Applies planning methods to decision-making related to life and work roles.	■	■	■
B. Management			
1 Employs management techniques to manage projects and enterprises related to work and life roles.	■	■	■
2. Applies marketing and promotional techniques to products and services in a business or social setting.	■	■	■
3. Demonstrates knowledge and abilities necessary as a contract employee or to initiate and maintain a service or product based business.	■	■	■
C. Finance			
1. Demonstrates financial planning ability and decision-making related to work and life roles	■	■	■
D. Technical and Production Skills in the Work Place			
1. Organizes work assignments by demonstrating production techniques.	■	■	■

ACADEMIC-APPLIED TECHNOLOGY CONNECTIONS			
DISCIPLINE	**Math**		
Applied Technology	**A. Data Analysis and Probability**		
	1. The student understands and uses the tools of data analysis for managing information.	2. The student identifies patterns and makes predictions from an orderly display of data using concepts of probability and statistics.	3. The student uses statistical methods to make inferences and valid arguments about real-world situations.
E. Technology			
1. Demonstrates use of applied technology to perform academic tasks.	■	■	■
2. Applies appropriate technology to an industry to solve technical and production problems.	■	■	■
F. Labor			
1. Demonstrates an understanding of labor issues related to the work place.	■	■	■
G. Community Issues			
1. Analyzes and communicates the impact that industry and the community have on each other and on the individual.	■	■	■
H. Health, Safety, and Environment			
1. Analyzes and communicates health and safety issues in the workplace.	■	■	■
I. Personal Conduct			
1. Demonstrates an understanding of professional conduct in personal roles, as well as in work and industry.	■	■	■

Applied Technology - Sunshine State Standards' Connections

Matrix with Language Arts

The appendix provides teacher validated curricular integration and transdisciplinary connections across the "Applied Technology Standards" (all aspects of the industry) developmental framework and the "Sunshine State Standards". The matrix provides a two dimensional picture of connections across standards and disciplines. A multidimensional model of connections can be expanded by further connecting the disciplines within the curriculum. The expansion of the two-dimensional model will be developed in a toolbox for teachers.

ACADEMIC-APPLIED TECHNOLOGY CONNECTIONS					
DISCIPLINE	**Language Arts**				
Applied Technology	**A. Reading**		**B. Writing**		**C. Listening, Viewing**
	1. The student uses the reading process effectively.	2. The student constructs meaning from a wide range of texts.	1. The student uses writing processes effectively.	2. The student writes to communicate ideas and information effectively.	1. The student uses effective listening strategies.
A. Planning					
1. Applies planning methods to decision-making related to life and work roles.	■	■	■	■	■
B. Management					
1. Employs management techniques to manage projects and enterprises related to work and life roles.	■	■	■	■	■
2. Applies marketing and promotional techniques to products and services in a business or social setting.	■	■	■	■	■
3. Demonstrates knowledge and abilities necessary as a contract employee or to initiate and maintain a service or product based business.	■	■	■	■	■
C. Finance					
1. Demonstrates financial planning ability and decision-making related to work and life roles.	■	■	■	■	■
D. Technical and Production Skills in the Work Place					
1. Organizes work assignments by demonstrating production techniques.	■	■	■	■	■

ACADEMIC-APPLIED TECHNOLOGY CONNECTIONS					
DISCIPLINE	**Language Arts**				
Applied Technology	A. Reading		B. Writing		C. Listening, Viewing and Speaking
	1. The student uses the reading process effectively.	2. The student constructs meaning from a wide range of texts.	1. The student uses writing processes effectively.	2. The student writes to communicate ideas and information effectively.	1. The student uses effective listening strategies.
E. Technology					
1. Demonstrates use of applied technology to perform academic tasks.	■	■	■	■	■
2. Applies appropriate technology to an industry to solve technical and production problems.	■	■	■	■	■
F. Labor					
1. Demonstrates an understanding of labor issues related to the work place.	■	■	■	■	■
G. Community Issues					
1. Analyzes and communicates the impact that industry and the community have on each other and on the individual.	■	■	■	■	■
H. Health, Safety, and Environment					
1. Analyzes and communicates health and safety issues in the workplace.	■	■	■	■	■
I. Personal Conduct					
1. Demonstrates an understanding of professional conduct in personal roles, as well as in work and industry.	■	■	■	■	■

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ACADEMIC-APPLIED TECHNOLOGY CONNECTIONS				
DISCIPLINE	**Language Arts**			
Applied Technology	**C. Listening, Viewing and Speaking (continued)**		**D. Language**	
	2. The student uses effective viewing strategies.	3. The student uses effective speaking strategies.	1. The student understands the nature of language.	2. The student understands the power of language.
A. Planning				
1. Applies planning methods to decision-making related to life and work roles.	■	■	■	■
B. Management				
1. Employs management techniques to manage projects and enterprises related to work and life roles.	■	■	■	■
2. Applies marketing and promotional techniques to products and services in a business or social setting.	■	■	■	■
3. Demonstrates knowledge and abilities necessary as a contract employee or to initiate and maintain a service or product based business.	■	■	■	■
C. Finance				
1. Demonstrates financial planning ability and decision-making related to work and life roles	■	■	■	■
D. Technical and Production Skills in the Work Place				
1. Organizes work assignments by demonstrating production techniques.	■	■	■	■

ACADEMIC-APPLIED TECHNOLOGY CONNECTIONS				
DISCIPLINE	**Language Arts**			
Applied Technology	**C. Listening, Viewing and Speaking (continued)**		**D. Language**	
	2. The student uses effective viewing strategies.	3. The student uses effective speaking strategies.	1. The student understands the nature of language.	2. The student understands the power of language.
E. Technology				
1. Demonstrates use of applied technology to perform academic tasks.	■	■	■	■
2. Applies appropriate technology to an industry to solve technical and production problems.	■	■	■	■
F. Labor				
1. Demonstrates an understanding of labor issues related to the work place.	■	■	■	■
G. Community Issues				
1. Analyzes and communicates the impact that industry and the community have on each other and on the individual.	■	■	■	■
H. Health, Safety, and Environment				
1. Analyzes and communicates health and safety issues in the workplace.	■	■	■	■
I. Personal Conduct				
1. Demonstrates an understanding of professional conduct in personal roles, as well as in work and industry.	■	■	■	■

ACADEMIC-APPLIED TECHNOLOGY CONNECTIONS		
DISCIPLINE	**Language Arts**	
Applied Technology	**E. Literature**	
	1. The student understands the common features of a variety of literary forms.	2. The student responds critically to fiction, nonfiction, poetry and drama.
A. Planning		
1. Applies planning methods to decision-making related to life and work roles.	■	
B. Management		
1. Employs management techniques to manage projects and enterprises related to work and life roles.	■	
2. Applies marketing and promotional techniques to products and services in a business or social setting.	■	■
3. Demonstrates knowledge and abilities necessary as a contract employee or to initiate and maintain a service or product based business.	■	
C. Finance		
1. Demonstrates financial planning ability and decision-making related to work and life roles		
D. Technical and Production Skills in the Work Place		
1. Organizes work assignments by demonstrating production techniques.	■	■

ACADEMIC-APPLIED TECHNOLOGY CONNECTIONS		
DISCIPLINE	**Language Arts**	
Applied Technology	**E. Literature**	
	1. The student understands the common features of a variety of literary forms.	2. The student responds critically to fiction, nonfiction, poetry and drama.
E. Technology		
1. Demonstrates use of applied technology to perform academic tasks.	■	■
2. Applies appropriate technology to an industry to solve technical and production problems.	■	■
F. Labor		
1. Demonstrates an understanding of labor issues related to the work place.		
G. Community Issues		
1. Analyzes and communicates the impact that industry and the community have on each other and on the individual.	■	■
H. Health, Safety, and Environment		
1. Analyzes and communicates health and safety issues in the workplace.		
I. Personal Conduct		
1. Demonstrates an understanding of professional conduct in personal roles, as well as in work and industry.	■	■

Applied Technology - Sunshine State Standards' Connections

Matrix with Social Studies

The appendix provides teacher validated curricular integration and transdisciplinary connections across the "Applied Technology Standards" (all aspects of the industry) developmental framework and the "Sunshine State Standards". The matrix provides a two dimensional picture of connections across standards and disciplines. A multidimensional model of connections can be expanded by further connecting the disciplines within the curriculum. The expansion of the two-dimensional model will be developed in a toolbox for teachers.

ACADEMIC-APPLIED TECHNOLOGY CONNECTIONS					
DISCIPLINE	**Social Studies**				
Applied Technology	**A. Time, Continuity and Change [History]**				
	1. The student understands historical chronology and the historical perspective.	2. The student understands the world from its beginnings to the time of the Renaissance.	3. The student understands Western and Eastern civilization since the Renaissance.	4. The student understands U.S. history to 1880.	5. The student understands U.S. history from 1880 to the present.
A. Planning					
1. Applies planning methods to decision-making related to life and work roles.	■	■	■	■	■
B. Management					
1 Employs management techniques to manage projects and enterprises related to work and life roles.	■				■
2. Applies marketing and promotional techniques to products and services in a business or social setting.	■				■
3. Demonstrates knowledge and abilities necessary as a contract employee or to initiate and maintain a service or product based business.	■				■
C. Finance					
1. Demonstrates financial planning ability and decision-making related to work and life roles	■			■	■
D. Technical and Production Skills in the Work Place					
1. Organizes work assignments by demonstrating production techniques.					

ACADEMIC-APPLIED TECHNOLOGY CONNECTIONS

DISCIPLINE	Social Studies				
Applied Technology	**A. Time, Continuity and Change [History]**				
	1. The student understands historical chronology and the historical perspective.	2. The student understands the world from its beginnings to the time of the Renaissance.	3. The student understands Western and Eastern civilization since the Renaissance.	4. The student understands U.S. history to 1880.	5. The student understands U.S. history from 1880 to the present.
E. Technology					
1. Demonstrates use of applied technology to perform academic tasks.	■				■
2. Applies appropriate technology to an industry to solve technical and production problems.	■				■
F. Labor					
1. Demonstrates an understanding of labor issues related to the work place.	■				■
G. Community Issues					
1. Analyzes and communicates the impact that industry and the community have on each other and on the individual.	■				■
H. Health, Safety and Environment					
1. Analyzes and communicates health and safety issues in the workplace.	■				■
I. Personal Conduct					
1. Demonstrates an understanding of professional conduct in personal roles, as well as in work and industry.	■				■

ACADEMIC-APPLIED TECHNOLOGY CONNECTIONS				
DISCIPLINE	**Social Studies**			
Applied Technology	**B. People, Places and Environment [Geography]**		**C. Government and Citizen [Civics and Government]**	
	1. The student understands the world in spatial terms.	2. The student understands the interactions of people and the physical environment.	1. The student understands the structure, functions and purposes of government and how the principles and values of American democracy are reflected in American constitutional government.	2. The student understands the role of the citizen in American democracy.
A. Planning				
1. Applies planning methods to decision-making related to life and work roles.	■	■	■	■
B. Management				
1. Employs management techniques to manage projects and enterprises related to work and life roles.	■	■	■	■
2. Applies marketing and promotional techniques to products and services in a business or social setting.	■	■	■	■
3. Demonstrates knowledge and abilities necessary as a contract employee or to initiate and maintain a service or product based business.	■	■	■	■
C. Finance				
1. Demonstrates financial planning ability and decision-making related to work and life roles	■	■	■	■
D. Technical and Production Skills in the Work Place				
1. Organizes work assignments by demonstrating production techniques.	■	■	■	■

ACADEMIC-APPLIED TECHNOLOGY CONNECTIONS

DISCIPLINE	Social Studies			
Applied Technology	**B. People, Places and Environment [Geography]**		**C. Government and Citizen [Civics and Government]**	
	1. The student understands the world in spatial terms.	2. The student understands the interactions of people and the physical environment.	1. The student understands the structure, functions and purposes of government and how the principles and values of American democracy are reflected in American constitutional government.	2. The student understands the role of the citizen in American democracy.
E. Technology				
1. Demonstrates use of applied technology to perform academic tasks.	■	■	■	■
2. Applies appropriate technology to an industry to solve technical and production problems.	■	■	■	■
F. Labor				
1. Demonstrates an understanding of labor issues related to the work place.	■	■	■	■
G. Community Issues				
1. Analyzes and communicates the impact that industry and the community have on each other and on the individual.	■	■	■	■
H. Health, Safety, and Environment				
1. Analyzes and communicates health and safety issues in the workplace.	■	■	■	■
I. Personal Conduct				
1. Demonstrates an understanding of professional conduct in personal roles, as well as in work and industry.	■	■	■	■

ACADEMIC-APPLIED TECHNOLOGY CONNECTIONS		
DISCIPLINE	**Social Studies**	
Applied Technology	**D. Economics**	
	1. The student understands how scarcity requires individuals and institutions to make choices about how to use resources.	2. The student understands the characteristics of different economic systems and institutions.
A. Planning		
1. Applies planning methods to decision-making related to life and work roles.	■	■
B. Management		
1. Employs management techniques to manage projects and enterprises related to work and life roles.	■	■
2. Applies marketing and promotional techniques to products and services in a business or social setting.	■	■
3. Demonstrates knowledge and abilities necessary as a contract employee or to initiate and maintain a service or product based business.	■	■
C. Finance		
1. Demonstrates financial planning ability and decision-making related to work and life roles.	■	■
D. Technical and Production Skills in the Work Place		
1. Organizes work assignments by demonstrating production techniques.	■	■

ACADEMIC-APPLIED TECHNOLOGY CONNECTIONS		
DISCIPLINE	**Social Studies**	
Applied Technology	**D. Economics**	
	1. The student understands how scarcity requires individuals and institutions to make choices about how to use resources.	2. The student understands the characteristics of different economic systems and institutions.
E. Technology		
1. Demonstrates use of applied technology to perform academic tasks.	■	■
2. Applies appropriate technology to an industry to solve technical and production problems.	■	■
F. Labor		
1. Demonstrates an understanding of labor issues related to the work place.	■	■
G. Community Issues		
1. Analyzes and communicates the impact that industry and the community have on each other and on the individual.	■	■
H. Health, Safety, and Environment		
1. Analyzes and communicates health and safety issues in the workplace.	■	■
I. Personal Conduct		
1. Demonstrates an understanding of professional conduct in personal roles, as well as in work and industry.	■	■

Applied Technology - Sunshine State Standards' Connections

Matrix with Science

The appendix provides teacher validated curricular integration and transdisciplinary connections across the "Applied Technology Standards" (all aspects of the industry) developmental framework and the "Sunshine State Standards".

The matrix provides a two dimensional picture of connections across standards and disciplines. A multidimensional model of connections can be expanded by further connecting the disciplines within the curriculum. The expansion of the two-dimensional model will be developed in a toolbox for teachers.

ACADEMIC-APPLIED TECHNOLOGY CONNECTIONS					
DISCIPLINE	**Science**				
Applied Technology	**A. The Nature of Matter.**		**B. Energy**		C. Force and Motion
	1. The student understands that all matter has observable, measurable properties.	2. The student understands the basic principles of atomic theory.	1. The student recognizes that energy may be changed in form with varying efficiency.	2. The student understands the interaction of matter and energy.	1. The student understands that types of motion may be described, measured, and predicted.
A. Planning					
1. Applies planning methods to decision-making related to life and work roles.	■		■	■	■
B. Management					
1 Employs management techniques to manage projects and enterprises related to work and life roles.	■		■	■	■
2. Applies marketing and promotional techniques to products and services in a business or social setting.	■		■	■	
3. Demonstrates knowledge and abilities necessary as a contract employee or to initiate and maintain a service or product based business.					
C. Finance					
1. Demonstrates financial planning ability and decision-making related to work and life roles.					
D. Technical and Production Skills in the Work Place					
1. Organizes work assignments by demonstrating production techniques.	■	■	■	■	■

ACADEMIC-APPLIED TECHNOLOGY CONNECTIONS					
DISCIPLINE	**Science**				
Applied Technology	**A. The Nature of**		**B. Energy**		**C. Force and Motion**
	1. The student understands that all matter has observable, measurable properties.	2. The student understands the basic principles of atomic theory.	1. The student recognizes that energy may be changed in form with varying efficiency.	2. The student understands the interaction of matter and energy.	1. The student understands that types of motion may be described, measured, and predicted.
E. Technology					
1. Demonstrates use of applied technology to perform academic tasks.	■	■	■	■	■
2. Applies appropriate technology to an industry to solve technical and production problems.	■	■	■	■	■
F. Labor					
1. Demonstrates an understanding of labor issues related to the work place.					
G. Community Issues					
1. Analyzes and communicates the impact that industry and the community have on each other and on the individual.	■	■	■	■	■
H. Health, Safety, and Environment					
1. Analyzes and communicates health and safety issues in the workplace.	■	■	■	■	■
I. Personal Conduct					
1. Demonstrates an understanding of professional conduct in personal roles, as well as in work and industry.	■	■	■	■	■

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ACADEMIC-APPLIED TECHNOLOGY CONNECTIONS					
DISCIPLINE	**Science**				
Applied Technology	**C. Force and Motion (continued)**	**D. Processes that Shape the Earth**		**E. Earth and Space**	
	2. The student understands that the types of force that act on an object and the effect of that force can be described, measured, and predicted.	1. The student recognizes that processes in the lithosphere, atmosphere, hydrosphere, and biosphere interact to shape the Earth.	2. The student understands the need for protection of the natural systems on Earth.	1. The student understands the interaction and organization in the Solar System and the universe and how this affects life on Earth.	2. The student recognizes the vastness of the universe and the Earth's place in it.
A. Planning					
1. Applies planning methods to decision-making related to life and work roles.	■	■	■	■	■
B. Management					
1 Employs management techniques to manage projects and enterprises related to work and life roles.	■	■	■	■	■
2. Applies marketing and promotional techniques to products and services in a business or social setting.	■		■	■	
3. Demonstrates knowledge and abilities necessary as a contract employee or to initiate and maintain a service or product based business.					
C. Finance					
1. Demonstrates financial planning ability and decision-making related to work and life roles.					
D. Technical and Production Skills in the Work Place					
1. Organizes work assignments by demonstrating production techniques.					

ACADEMIC-APPLIED TECHNOLOGY CONNECTIONS

DISCIPLINE	Science				
Applied Technology	**C. Force and Motion (continued)**	**D. Processes that Shape the Earth**		**E. Earth and Space**	
	2. The student understands that the types of force that act on an object and the effect of that force can be described, measured, and predicted.	1. The student recognizes that processes in the lithosphere, atmosphere, hydrosphere, and biosphere interact to shape the Earth.	2. The student understands the need for protection of the natural systems on Earth.	1. The student understands the interaction and organization in the Solar System and the universe and how this affects life on Earth.	2. The student recognizes the vastness of the universe and the Earth's place in it.
E. Technology					
1. Demonstrates use of applied technology to perform academic tasks.	■	■	■	■	■
2. Applies appropriate technology to an industry to solve technical and production problems.	■	■	■	■	■
F. Labor					
1. Demonstrates an understanding of labor issues related to the work place.	■	■	■	■	
G. Community Issues					
1. Analyzes and communicates the impact that industry and the community have on each other and on the individual.	■	■	■	■	■
H. Health, Safety, and Environment					
1. Analyzes and communicates health and safety issues in the workplace.	■	■	■	■	■
I. Personal Conduct					
1. Demonstrates an understanding of professional conduct in personal roles, as well as in work and industry.	■	■	■	■	

ACADEMIC-APPLIED TECHNOLOGY CONNECTIONS				
DISCIPLINE	**Science**			
Applied Technology	**F. Processes of Life**		**G. How living things interact with their environment**	
	1. The student describes patterns of structure and function in living things.	2. The student understands the process and importance of genetic diversity.	1. The student understands the competitive, interdependent, cyclic nature of living things in the environment.	2. The student understands the consequences of using limited natural resources.
A. Planning				
1. Applies planning methods to decision-making related to life and work roles.	■	■	■	■
B. Management				
1 Employs management techniques to manage projects and enterprises related to work and life roles.	■	■	■	■
2. Applies marketing and promotional techniques to products and services in a business or social setting.	■	■	■	■
3. Demonstrates knowledge and abilities necessary as a contract employee or to initiate and maintain a service or product based business.				
C. Finance				
1. Demonstrates financial planning ability and decision-making related to work and life roles	■	■	■	■
D. Technical and Production Skills in the Work Place				
1. Organizes work assignments by demonstrating production techniques.	■	■	■	■

ACADEMIC-APPLIED TECHNOLOGY CONNECTIONS

DISCIPLINE	Science			
Applied Technology	**F. Processes of Life**		**G. How living things interact with their environment**	
	1. The student describes patterns of structure and function in living things.	2. The student understands the process and importance of genetic diversity.	1. The student understands the competitive, interdependent, cyclic nature of living things in the environment.	2. The student understands the consequences of using limited natural resources.
E. Technology				
1. Demonstrates use of applied technology to perform academic tasks.	■	■	■	■
2. Applies appropriate technology to an industry to solve technical and production problems.	■	■	■	■
F. Labor				
1. Demonstrates an understanding of labor issues related to the work place.	■	■	■	■
G. Community Issues				
1. Analyzes and communicates the impact that industry and the community have on each other and on the individual.	■	■	■	■
H. Health, Safety, and Environment				
1. Analyzes and communicates health and safety issues in the workplace.	■	■	■	■
I. Personal Conduct				
1. Demonstrates an understanding of professional conduct in personal roles, as well as in work and industry.	■	■	■	■

ACADEMIC-APPLIED TECHNOLOGY CONNECTIONS			
DISCIPLINE	**Science**		
Applied Technology	**H. The Nature of Science**		
	1. The student uses the scientific processes and habits of mind to solve problems.	2. The student understands that most natural events occur in comprehensible consistent patterns.	3. The student understands that science, technology, and society are interwoven and interdependent.
A. Planning			
1. Applies planning methods to decision-making related to life and work roles.	■	■	■
B. Management			
1 Employs management techniques to manage projects and enterprises related to work and life roles.	■	■	■
2. Applies marketing and promotional techniques to products and services in a business or social setting.	■	■	■
3. Demonstrates knowledge and abilities necessary as a contract employee or to initiate and maintain a service or product based business.	■	■	■
C. Finance			
1. Demonstrates financial planning ability and decision-making related to work and life roles.	■	■	■
D. Technical and Production Skills in the Work Place			
1. Organizes work assignments by demonstrating production techniques.	■	■	■

ACADEMIC-APPLIED TECHNOLOGY CONNECTIONS			
DISCIPLINE	**Science**		
Applied Technology	**H. The Nature of Science**		
	1. The student uses the scientific processes and habits of mind to solve problems.	2. The student understands that most natural events occur in comprehensible consistent patterns.	3. The student understands that science, technology, and society are interwoven and interdependent.
E. Technology			
1. Demonstrates use of applied technology to perform academic tasks.	■	■	■
2. Applies appropriate technology to an industry to solve technical and production problems.	■	■	■
F. Labor			
1. Demonstrates an understanding of labor issues related to the work place.	■	■	■
G. Community Issues			
1. Analyzes and communicates the impact that industry and the community have on each other and on the individual.	■	■	■
H. Health, Safety, and Environment			
1. Analyzes and communicates health and safety issues in the workplace.	■	■	■
I. Personal Conduct			
1. Demonstrates an understanding of professional conduct in personal roles, as well as in work and industry.	■	■	■

Applied Technology - Sunshine State Standards' Connections

Matrix with Health and Physical Education

The appendix provides teacher validated curricular integration and transdisciplinary connections across the "Applied Technology Standards" (all aspects of the industry) developmental framework and the "Sunshine State Standards".

The matrix provides a two dimensional picture of connections across standards and disciplines. A multidimensional model of connections can be expanded by further connecting the disciplines within the curriculum. The expansion of the two-dimensional model will be developed in a toolbox for teachers.

ACADEMIC-APPLIED TECHNOLOGY CONNECTIONS					
DISCIPLINE	**Health and Physical Education**				
Applied Technology	***Health*** **A. Health Literacy**		**B. Responsible Health Behavior**		
	1. The student comprehends concepts related to health promotion and disease prevention.	2. The student knows how to access valid health information and health-promoting products and services.	1. The student knows health-enhancing behaviors and how to reduce health risks.	2. The student analyzes the influence of culture, media, technology and other factors on health.	3. The student knows how to use effective interpersonal communication skills that enhance health.
A. Planning					
1. Applies planning methods to decision-making related to life and work roles.	■	■	■	■	■
B. Management					
1. Employs management techniques to manage projects and enterprises related to work and life roles.	■	■	■	■	■
2. Applies marketing and promotional techniques to products and services in a business or social setting.	■	■	■	■	■
3. Demonstrates knowledge and abilities necessary as a contract employee or to initiate and maintain a service or product based business.	■		■	■	
C. Finance					
1. Demonstrates financial planning ability and decision-making related to work and life roles.	■	■	■	■	
D. Technical and Production Skills in the Work Place					
1. Organizes work assignments by demonstrating production techniques.	■	■	■	■	

ACADEMIC-APPLIED TECHNOLOGY CONNECTIONS					
DISCIPLINE	**Health and Physical Education**				
Applied Technology	**A. Health Literacy**		**B. Responsible Health Behavior**		
	1. The student comprehends concepts related to health promotion and disease prevention.	2. The student knows how to access valid health information and health-promoting products and services.	1. The student knows health-enhancing behaviors and how to reduce health risks.	2. The student analyzes the influence of culture, media, technology and other factors on health.	3. The student knows how to use effective interpersonal communication skills that enhance health.
E. Technology					
1. Demonstrates use of applied technology to perform academic tasks.	■	■	■	■	■
2. Applies appropriate technology to an industry to solve technical and production problems.	■	■	■	■	■
F. Labor					
1. Demonstrates an understanding of labor issues related to the work place.	■		■	■	■
G. Community Issues					
1. Analyzes and communicates the impact that industry and the community have on each other and on the individual.	■	■	■	■	■
H. Health, Safety, and Environment					
1. Analyzes and communicates health and safety issues in the workplace.	■	■	■	■	■
I. Personal Conduct					
1. Demonstrates an understanding of professional conduct in personal roles, as well as in work and industry.	■	■	■	■	■

ACADEMIC-APPLIED TECHNOLOGY CONNECTIONS					
DISCIPLINE	**Health and Physical Education**				
Applied Technology	**C. Advocate and Promote Healthy Living**		***PHYSICAL EDUCATION*** **A. Physical Education Literacy**		
	1. The student knows how to use goal-setting and decision-making skills that enhance health.	2. The student knows how to advocate for personal, family and community health.	1. The student demonstrates competency in many movement forms and proficiency in a few forms of physical activity.	2. The student applies concepts and principles of human movement to the development of motor skills and the learning of new skills.	3. The student analyzes the benefits of regular participation in physical activity.
A. Planning					
1. Applies planning methods to decision-making related to life and work roles.	■	■	■	■	■
B. Management					
1. Employs management techniques to manage projects and enterprises related to work and life roles.	■	■	■	■	■
2. Applies marketing and promotional techniques to products and services in a business or social setting.	■	■			
3. Demonstrates knowledge and abilities necessary as a contract employee or to initiate and maintain a service or product based business.	■	■			
C. Finance					
1. Demonstrates financial planning ability and decision-making related to work and life roles.	■	■			■
D. Technical and Production Skills in the Work Place					
1. Organizes work assignments by demonstrating production techniques.	■	■	■	■	■

ACADEMIC-APPLIED TECHNOLOGY CONNECTIONS					
DISCIPLINE	**Health and Physical Education**				
Applied Technology	**C. Advocate and Promote Healthy Living**		***PHYSICAL EDUCATION*** **A. Physical Education Literacy**		
	1. The student knows how to use goal-setting and decision-making skills that enhance health.	2. The student knows how to advocate for personal, family and community health.	1. The student demonstrates competency in many movement forms and proficiency in a few forms of physical activity.	2. The student applies concepts and principles of human movement to the development of motor skills and the learning of new skills.	3. The student analyzes the benefits of regular participation in physical activity.
E. Technology					
1. Demonstrates use of applied technology to perform academic tasks.	■	■	■	■	■
2. Applies appropriate technology to an industry to solve technical and production problems.	■	■	■	■	■
F. Labor					
1. Demonstrates an understanding of labor issues related to the work place.	■	■	■	■	■
G. Community Issues					
1. Analyzes and communicates the impact that industry and the community have on each other and on the individual.	■	■			
H. Health, Safety, and Environment					
1. Analyzes and communicates health and safety issues in the workplace.	■	■	■	■	■
I. Personal Conduct					
1. Demonstrates an understanding of professional conduct in personal roles, as well as in work and industry.	■	■	■	■	■

ACADEMIC-APPLIED TECHNOLOGY CONNECTIONS				
DISCIPLINE	**Health and Physical Education**			
Applied Technology	**B. Responsible Physical Activity Behaviors**		**C. Advocate and Promote Physically Active Lifestyles**	
	1. The student achieves and maintains a health-enhancing level of physical fitness.	2. The student demonstrates responsible personal and social behavior in physical activity.	1. The student understands how participating in physical activity promotes inclusion and an understanding of the abilities and cultural diversity of people.	2. The student understands that physical activity provides the opportunity for enjoyment, challenge, self-expression and communication.
A. Planning				
1. Applies planning methods to decision-making related to life and work roles.	■	■	■	■
B. Management				
1. Employs management techniques to manage projects and enterprises related to work and life roles.	■	■	■	■
2. Applies marketing and promotional techniques to products and services in a business or social setting.				
3. Demonstrates knowledge and abilities necessary as a contract employee or to initiate and maintain a service or product based business.				
C. Finance				
1. Demonstrates financial planning ability and decision-making related to work and life roles.				
D. Technical and Production Skills in the Work Place				
1. Organizes work assignments by demonstrating production techniques.	■	■	■	■

ACADEMIC-APPLIED TECHNOLOGY CONNECTIONS				
DISCIPLINE	**Health and Physical Education**			
Applied Technology	**B. Responsible Physical Activity Behaviors**		**C. Advocate and Promote Physically Active Lifestyles**	
	1. The student achieves and maintains a health-enhancing level of physical fitness.	2. The student demonstrates responsible personal and social behavior in physical activity.	1. The student understands how participating in physical activity promotes inclusion and an understanding of the abilities and cultural diversity of people.	2. The student understands that physical activity provides the opportunity for enjoyment, challenge, self-expression and communication.
E. Technology				
1. Demonstrates use of applied technology to perform academic tasks.	■	■	■	■
2. Applies appropriate technology to an industry to solve technical and production problems.	■	■	■	■
F. Labor				
1. Demonstrates an understanding of labor issues related to the work place.	■	■		
G. Community Issues				
1. Analyzes and communicates the impact that industry and the community have on each other and on the individual.				
H. Health, Safety, and Environment				
1. Analyzes and communicates health and safety issues in the workplace.	■	■	■	■
I. Personal Conduct				
1. Demonstrates an understanding of professional conduct in personal roles, as well as in work and industry.	■	■	■	■

Applied Technology - Sunshine State Standards' Connections

Matrix with Foreign Language

The appendix provides teacher validated curricular integration and transdisciplinary connections across the "Applied Technology Standards" (all aspects of the industry) developmental framework and the "Sunshine State Standards".

The matrix provides a two dimensional picture of connections across standards and disciplines. A multidimensional model of connections can be expanded by further connecting the disciplines within the curriculum. The expansion of the two-dimensional model will be developed in a toolbox for teachers.

ACADEMIC-APPLIED TECHNOLOGY CONNECTIONS					
DISCIPLINE	**Foreign Language**				
Applied Technology	**A. Communication**			**B. Culture**	**C. Connections**
	1. The student engages in conversation, expresses feelings and emotions and exchanges opinions.	2. The student understands and interprets written and spoken language on a variety of topics.	3. The student presents information, concepts and ideas to an audience of listeners or readers on a variety of topics.	1. The student understands the relationship between the perspectives and products of culture studied and uses this knowledge to recognize cultural practices.	1. The student reinforces and furthers knowledge of other disciplines through foreign language.
A. Planning					
1. Applies planning methods to decision-making related to life and work roles.	■	■	■	■	■
B. Management					
1. Employs management techniques to manage projects and enterprises related to work and life roles.		■		■	■
2. Applies marketing and promotional techniques to products and services in a business or social setting.	■	■	■	■	■
3. Demonstrates knowledge and abilities necessary as a contract employee or to initiate and maintain a service or product based business.	■	■	■	■	■
C. Finance					
1. Demonstrates financial planning ability and decision-making related to work and life roles.	■	■	■	■	■
D. Technical and Production Skills in the Work Place					
1. Organizes work assignments by demonstrating production techniques.	■	■	■	■	■

ACADEMIC-APPLIED TECHNOLOGY CONNECTIONS

DISCIPLINE	Foreign Language				
Applied Technology	**A. Communication**			**B. Culture**	**C. Connections**
	1. The student engages in conversation, expresses feelings and emotions and exchanges opinions.	2. The student understands and interprets written and spoken language on a variety of topics.	3. The student presents information, concepts and ideas to an audience of listeners or readers on a variety of topics.	1. The student understands the relationship between the perspectives and products of culture studied and uses this knowledge to recognize cultural practices.	1. The student reinforces and furthers knowledge of other disciplines through foreign language.
E. Technology					
1. Demonstrates use of applied technology to perform academic tasks.	■	■	■	■	■
2. Applies appropriate technology to an industry to solve technical and production problems.	■	■	■	■	■
F. Labor					
1. Demonstrates an understanding of labor issues related to the work place.	■	■	■	■	■
G. Community Issues					
1. Analyzes and communicates the impact that industry and the community have on each other and on the individual.	■	■	■	■	■
H. Health, Safety, and Environment					
1. Analyzes and communicates health and safety issues in the workplace.	■	■	■	■	■
I. Personal Conduct					
1. Demonstrates an understanding of professional conduct in personal roles, as well as in work and industry.	■	■	■	■	■

ACADEMIC-APPLIED TECHNOLOGY CONNECTIONS					
DISCIPLINE		**Foreign Language**			
Applied Technology		C. Connections (continued)	D. Comparisons		E. Experiences
		2. The student acquires information and perspectives that are available only through the foreign language and within the target culture.	1. The student recognizes that languages have different patterns of communication and applies this knowledge to his or her own culture.	2. The student recognizes that cultures have different patterns of interaction and applies this knowledge to his or her own culture.	1. The student uses the language within and beyond the school setting.
A. Planning					
1. Applies planning methods to decision-making related to life and work roles.		■	■	■	■
B. Management					
1 Employs management techniques to manage projects and enterprises related to work and life roles.		■	■	■	■
2. Applies marketing and promotional techniques to products and services in a business or social setting.		■	■	■	■
3. Demonstrates knowledge and abilities necessary as a contract employee or to initiate and maintain a service or product based business.		■	■	■	■
C. Finance					
1. Demonstrates financial planning ability and decision-making related to work and life roles.					
D. Technical and Production Skills in the Work Place					
1. Organizes work assignments by demonstrating production techniques.		■	■	■	■

ACADEMIC-APPLIED TECHNOLOGY CONNECTIONS

DISCIPLINE	Foreign Language			
Applied Technology	**C. Connections (continued)**	**D. Comparisons**		**E. Experiences**
	2. The student acquires information and perspectives that are available only through the foreign language and within the target culture.	1. The student recognizes that languages have different patterns of communication and applies this knowledge to his or her own culture.	2. The student recognizes that cultures have different patterns of interaction and applies this knowledge to his or her own culture.	1. The student uses the language within and beyond the school setting.
E. Technology				
1. Demonstrates use of applied technology to perform academic tasks.	■		■	■
2. Applies appropriate technology to an industry to solve technical and production problems.	■		■	■
F. Labor				
1. Demonstrates an understanding of labor issues related to the work place.	■		■	■
G. Community Issues				
1. Analyzes and communicates the impact that industry and the community have on each other and on the individual.	■		■	■
H. Health, Safety, and Environment				
1. Analyzes and communicates health and safety issues in the workplace.	■		■	■
I. Personal Conduct				
1. Demonstrates an understanding of professional conduct in personal roles, as well as in work and industry.	■		■	■

Applied Technology - Sunshine State Standards' Connections

Matrix with The Arts

The appendix provides teacher validated curricular integration and transdisciplinary connections across the "Applied Technology Standards" (all aspects of the industry) developmental framework and the "Sunshine State Standards".

The matrix provides a two dimensional picture of connections across standards and disciplines. A multidimensional model of connections can be expanded by further connecting the disciplines within the curriculum. The expansion of the two-dimensional model will be developed in a toolbox for teachers.

ACADEMIC-APPLIED TECHNOLOGY CONNECTIONS					
DISCIPLINE	**The Arts**				
Applied Technology	***Music*** **A. Skills and Techniques**			**B. Creation and Communication**	
	1. The student sings, alone and with others, a varied repertoire of music.	2. The student performs on instruments, alone and with others, a varied repertoire of music.	3. The student reads and notates music.	1. The student improvises melodies, variation, and accompaniments.	2. The student composes and arranges music within specific guidelines.
A. Planning					
1. Applies planning methods to decision-making related to life and work roles.					
B. Management					
1 Employs management techniques to manage projects and enterprises related to work and life roles.					
2. Applies marketing and promotional techniques to products and services in a business or social setting.					
3. Demonstrates knowledge and abilities necessary as a contract employee or to initiate and maintain a service or product based business.	■	■		■	■
C. Finance					
1. Demonstrates financial planning ability and decision-making related to work and life roles.					
D. Technical and Production Skills in the Work Place					
1. Organizes work assignments by demonstrating production techniques.	■	■	■	■	■

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ACADEMIC-APPLIED TECHNOLOGY CONNECTIONS					
DISCIPLINE	**The Arts**				
Applied Technology	***Music*** **A. Skills and Techniques**			**B. Creation and Communication**	
	1. The student sings, alone and with others, a varied repertoire of music.	2. The student performs on instruments, alone and with others, a varied repertoire of music.	3. The student reads and notates music.	1. The student improvises melodies, variation, and accompaniments.	2. The student composes and arranges music within specific guidelines.
E. Technology					
1. Demonstrates use of applied technology to perform academic tasks.	■	■		■	■
2. Applies appropriate technology to an industry to solve technical and production problems.	■	■		■	■
F. Labor					
1. Demonstrates an understanding of labor issues related to the work place.					
G. Community Issues					
1. Analyzes and communicates the impact that industry and the community have on each other and on the individual.	■	■		■	■
H. Health, Safety, and Environment					
1. Analyzes and communicates health and safety issues in the workplace.					
I. Personal Conduct					
1. Demonstrates an understanding of professional conduct in personal roles, as well as in work and industry.	■	■		■	■

ACADEMIC-APPLIED TECHNOLOGY CONNECTIONS					
DISCIPLINE	**The Arts**				
Applied Technology	C. Cultural and Historical Connections	D. Aesthetic and Critical Analysis		E. Applications to Life	
	1. The student understands music in relation to culture and history.	1. The student listens to, analyzes and describes music.	2. The student evaluates music and music performance.	1. The student understands the relationship between music, the other arts and disciplines outside the arts.	2. The student understands the relationship between music and the world beyond the school setting.
A. Planning					
1. Applies planning methods to decision-making related to life and work roles.	■	■	■	■	■
B. Management					
1. Employs management techniques to manage projects and enterprises related to work and life roles.	■	■	■	■	■
2. Applies marketing and promotional techniques to products and services in a business or social setting.	■	■	■	■	■
3. Demonstrates knowledge and abilities necessary as a contract employee or to initiate and maintain a service or product based business.	■			■	■
C. Finance					
1. Demonstrates financial planning ability and decision-making related to work and life roles.	■			■	■
D. Technical and Production Skills in the Work Place					
1. Organizes work assignments by demonstrating production techniques.	■			■	■

ACADEMIC-APPLIED TECHNOLOGY CONNECTIONS					
DISCIPLINE	**The Arts**				
Applied Technology	**C. Cultural and Historical Connections**	**D. Aesthetic and Critical Analysis**		**E. Applications to Life**	
	1. The student understands music in relation to culture and history.	1. The student listens to, analyzes and describes music.	2. The student evaluates music and music performance.	1. The student understands the relationship between music, the other arts and disciplines outside the arts.	2. The student understands the relationship between music and the world beyond the school setting.
E. Technology					
1. Demonstrates use of applied technology to perform academic tasks.	■		■	■	■
2. Applies appropriate technology to an industry to solve technical and production problems	■		■	■	■
F. Labor					
1. Demonstrates an understanding of labor issues related to the work place.				■	■
G. Community Issues					
1. Analyzes and communicates the impact that industry and the community have on each other and on the individual.	■	■	■	■	■
H. Health, Safety, and Environment					
1. Analyzes and communicates health and safety issues in the workplace.				■	■
I. Personal Conduct					
1. Demonstrates an understanding of professional conduct in personal roles, as well as in work and industry.	■		■	■	■

ACADEMIC-APPLIED TECHNOLOGY CONNECTIONS					
DISCIPLINE	**The Arts**				
Applied Technology	***VISUAL ARTS*** **A. Skills and Techniques**	**B. Creation and Communication**	**C. Cultural and Historical Connections**	**D. Aesthetic and Critical Analysis**	**E. Applications to Life**
•	1. The student understands and applies media, techniques and processes.	1. The student creates and communicates a range of subject matter, symbols, and ideas using knowledge of structures and functions of visual arts.	1. The student understands the visual arts in relation to history and culture.	1. The student assesses, evaluates, and responds to the characteristics of works of art.	1. The student makes connections between the visual arts, other disciplines and the real world.
A. Planning					
1. Applies planning methods to decision-making related to life and work roles.	■	■	■	■	■
B. Management					
1. Employs management techniques to manage projects and enterprises related to work and life roles.	■	■			■
2. Applies marketing and promotional techniques to products and services in a business or social setting.	■	■	■	■	■
3. Demonstrates knowledge and abilities necessary as a contract employee or to initiate and maintain a service or product based business.	■	■	■	■	■
C. Finance					
1. Demonstrates financial planning ability and decision-making related to work and life roles.	■	■	■	■	■
D. Technical and Production Skills in the Work Place					
1. Organizes work assignments by demonstrating production techniques.	■	■	■	■	■

ACADEMIC-APPLIED TECHNOLOGY CONNECTIONS					
DISCIPLINE	**The Arts**				
Applied Technology	***VISUAL ARTS*** **A. Skills and Techniques**	**B. Creation and Communication**	**C. Cultural and Historical Connections**	**D. Aesthetic and Critical Analysis**	**E. Applications to Life**
	1. The student understands and applies media, techniques and processes.	1. The student creates and communicates a range of subject matter, symbols, and ideas using knowledge of structures and functions of visual arts.	1. The student understands the visual arts in relation to history and culture.	1. The student assesses, evaluates, and responds to the characteristics of works of art.	1. The student makes connections between the visual arts, other disciplines and the real world.
E. Technology					
1. Demonstrates use of applied technology to perform academic tasks.	■	■	■	■	■
2. Applies appropriate technology to an industry to solve technical and production problems.	■	■	■	■	■
F. Labor					
1. Demonstrates an understanding of labor issues related to the work place.	■	■	■	■	■
G. Community Issues					
1. Analyzes and communicates the impact that industry and the community have on each other and on the individual.	■	■	■	■	■
H. Health, Safety, and Environment					
1. Analyzes and communicates health and safety issues in the workplace.	■	■	■	■	■
I. Personal Conduct					
1. Demonstrates an understanding of professional conduct in personal roles, as well as in work and industry.	■	■	■	■	■

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ACADEMIC-APPLIED TECHNOLOGY CONNECTIONS					
DISCIPLINE	**The Arts**				
Applied Technology	***THEATER*** **A. Skills and Techniques**			**B. Creation and Communication**	**C. Cultural and Historical Connections**
	1. The student acts by developing, communicating and sustaining characters in improvisation and formal or informal productions.	2. The student directs by interpreting dramatic texts and organizing and conducting rehearsals for formal and informal productions.	3. The student designs, conceptualizes, and interprets formal and informal productions.	1. The student improvises, writes and refines scripts based on heritage, imagination, literature, history and personal experiences.	1. The student understands context by analyzing the role of theater, film, television, and electronic media in the past and present.
A. Planning					
1. Applies planning methods to decision-making related to life and work roles.	■	■	■	■	■
B. Management					
1 Employs management techniques to manage projects and enterprises related to work and life roles.	■	■	■	■	■
2. Applies marketing and promotional techniques to products and services in a business or social setting.	■	■	■	■	■
3. Demonstrates knowledge and abilities necessary as a contract employee or to initiate and maintain a service or product based business.	■	■	■	■	
C. Finance					
1. Demonstrates financial planning ability and decision-making related to work and life roles.	■	■	■	■	■
D. Technical and Production Skills in the Work Place					
1. Organizes work assignments by demonstrating production techniques.	■	■	■	■	■

ACADEMIC-APPLIED TECHNOLOGY CONNECTIONS					
DISCIPLINE	**The Arts**				
Applied Technology	***THEATER*** **A. Skills and Techniques**			**B. Creation and Communication**	**C. Cultural and Historical Connections**
	1. The student acts by developing, communicating and sustaining characters in improvisation and formal or informal productions.	2. The student directs by interpreting dramatic texts and organizing and conducting rehearsals for formal and informal productions.	3. The student designs, conceptualizes, and interprets formal and informal productions.	1. The student improvises, writes and refines scripts based on heritage, imagination, literature, history and personal experiences.	1. The student understands context by analyzing the role of theater, film, television, and electronic media in the past and present.
E. Technology					
1. Demonstrates use of applied technology to perform academic tasks.	■	■	■	■	■
2. Applies appropriate technology to an industry to solve technical and production problems.	■	■	■	■	■
F. Labor					
1. Demonstrates an understanding of labor issues related to the work place.	■	■	■	■	■
G. Community Issues					
1. Analyzes and communicates the impact that industry and the community have on each other and on the individual.	■	■	■	■	■
H. Health, Safety, and Environment					
1. Analyzes and communicates health and safety issues in the workplace.	■	■	■	■	■
I. Personal Conduct					
1. Demonstrates an understanding of professional conduct in personal roles, as well as in work and industry.	■	■	■	■	■

ACADEMIC-APPLIED TECHNOLOGY CONNECTIONS					
DISCIPLINE	**The Arts**				
Applied Technology	**D. Aesthetic and Critical Analysis**	**E. Applications to Life**	***DANCE*** **A. Skills and Techniques**		**B. Creation and Communication**
	1. The student analyzes, criticizes and constructs meaning from formal and informal theater, film, television and electronic media.	1. The student understands application of the role of theater, film, television and electronic media in everyday life.	1. The student identifies and demonstrates movement elements in performing dance.	2. The student understands choreographic principles, processes, and structures.	1. The student understands dance is a way to create meaning.
A. Planning					
1. Applies planning methods to decision-making related to life and work roles.		■	■	■	
B. Management					
1. Employs management techniques to manage projects and enterprises related to work and life roles.	■	■	■		
2. Applies marketing and promotional techniques to products and services in a business or social setting.	■	■	■		
3. Demonstrates knowledge and abilities necessary as a contract employee or to initiate and maintain a service or product based business.	■	■			
C. Finance					
1. Demonstrates financial planning ability and decision-making related to work and life roles.	■	■	■		
D. Technical and Production Skills in the Work Place					
1. Organizes work assignments by demonstrating production techniques.	■	■	■	■	

ACADEMIC-APPLIED TECHNOLOGY CONNECTIONS					
DISCIPLINE	**The Arts**				
Applied Technology	**D. Aesthetic and Critical Analysis**	**E. Applications to Life**	***DANCE*** **A. Skills and Techniques**		**B. Creation and Communication**
	1. The student analyzes, criticizes and constructs meaning from formal and informal theater, film, television and electronic media.	1. The student understands application of the role of theater, film, television and electronic media in everyday life.	1. The student identifies and demonstrates movement elements in performing dance.	2. The student understands choreographic principles, processes, and structures.	1. The student understands dance is a way to create meaning.
E. Technology					
1. Demonstrates use of applied technology to perform academic tasks.	■	■	■	■	
2. Applies appropriate technology to an industry to solve technical and production problems.	■	■	■	■	■
F. Labor					
1. Demonstrates an understanding of labor issues related to the work place.	■	■	■	■	
G. Community Issues					
1. Analyzes and communicates the impact that industry and the community have on each other and on the individual.	■	■	■	■	■
H. Health, Safety, and Environment					
1. Analyzes and communicates health and safety issues in the workplace.	■	■	■	■	■
I. Personal Conduct					
1. Demonstrates an understanding of professional conduct in personal roles, as well as in work and industry.	■	■	■	■	■

ACADEMIC-APPLIED TECHNOLOGY CONNECTIONS				
DISCIPLINE	**The Arts**			
Applied Technology	**C. Cultural and Historical Connections**	**D. Aesthetic and Critical Analysis**	**E. Applications to Life**	
	1. The student demonstrates and understands dance in various cultures and historical periods.	1. The student applies and demonstrates critical and creative thinking skills in dance.	1. The student makes connections between dance and healthful living.	2. The student makes connections between dance and other disciplines.
A. Planning				
1. Applies planning methods to decision-making related to life and work roles.	■	■	■	■
B. Management				
1. Employs management techniques to manage projects and enterprises related to work and life roles.	■	■	■	■
2. Applies marketing and promotional techniques to products and services in a business or social setting.	■	■	■	■
3. Demonstrates knowledge and abilities necessary as a contract employee or to initiate and maintain a service or product based business.	■	■	■	■
C. Finance				
1. Demonstrates financial planning ability and decision-making related to work and life roles.			■	■
D. Technical and Production Skills in the Work Place				
1. Organizes work assignments by demonstrating production techniques.	■	■	■	■

ACADEMIC-APPLIED TECHNOLOGY CONNECTIONS				
DISCIPLINE	**The Arts**			
Applied Technology	C. Cultural and Historical Connections	D. Aesthetic and Critical Analysis	E. Applications to Life	
	1. The student demonstrates and understands dance in various cultures and historical periods.	1. The student applies and demonstrates critical and creative thinking skills in dance.	1. The student makes connections between dance and healthful living.	2. The student makes connections between dance and other disciplines.
E. Technology				
1. Demonstrates use of applied technology to perform academic tasks.	■	■	■	■
2. Applies appropriate technology to an industry to solve technical and production problems.	■	■	■	■
F. Labor				
1. Demonstrates an understanding of labor issues related to the work place.	■	■	■	■
G. Community Issues				
1. Analyzes and communicates the impact that industry and the community have on each other and on the individual.	■	■	■	■
H. Health, Safety, and Environment				
1. Analyzes and communicates health and safety issues in the workplace.			■	■
I. Personal Conduct				
1. Demonstrates an understanding of professional conduct in personal roles, as well as in work and industry.	■	■	■	■

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